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1901/02

E. D. Ball

THE BIENNIAL REPORT

OF THE

BOARD OF TRUSTEES

OF THE

Agricultural College of Utah

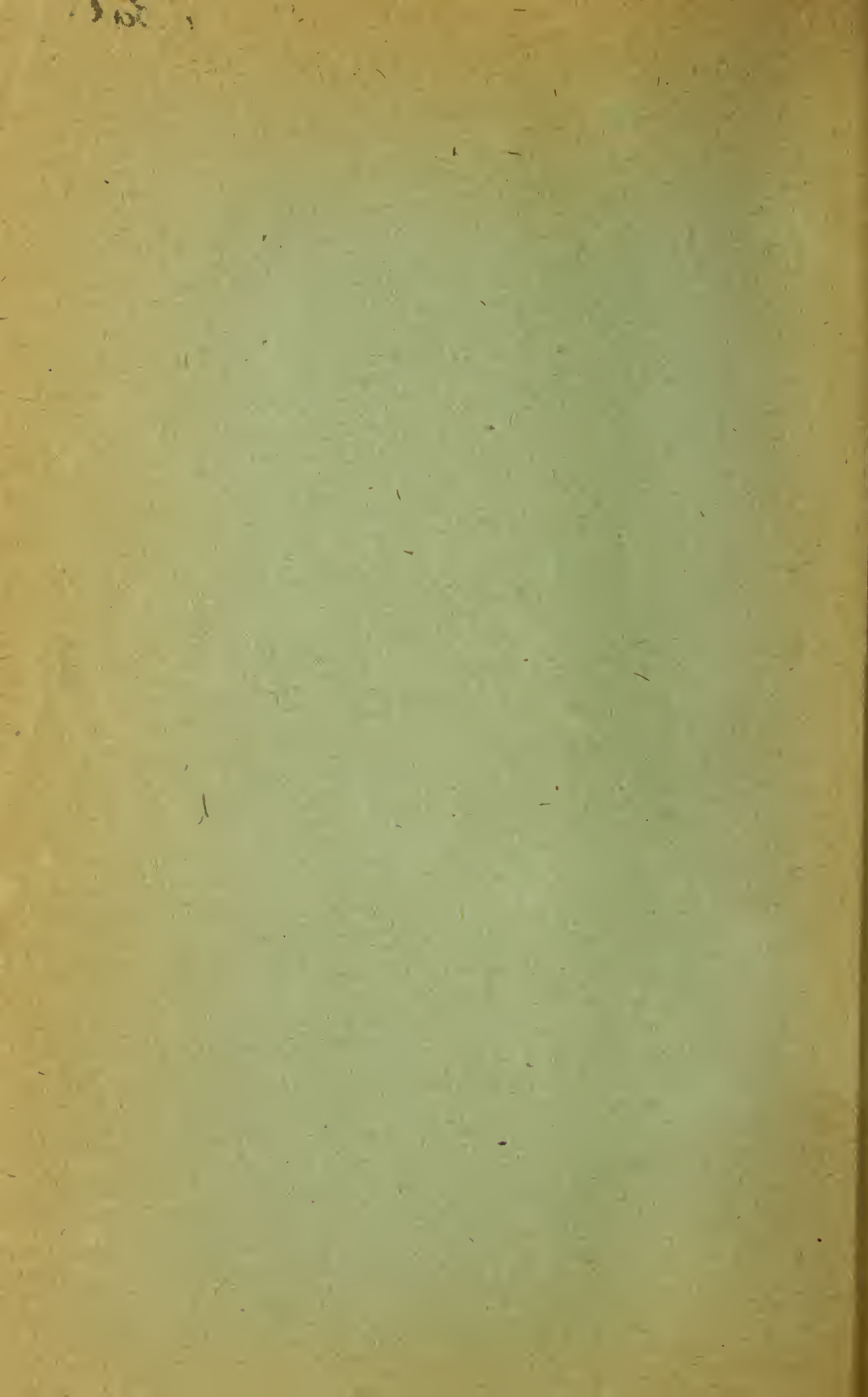
For the Years 1901-1902

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THE REPORT OF THE PRESIDENT, AND THE SECRETARY'S

REPORT OF THE RECEIPTS AND

DISBURSEMENTS



THE BIENNIAL REPORT

OF THE

BOARD OF TRUSTEES

OF THE

Agricultural College of Utah

For the Years 1901-1902.

ACCOMPANIED BY

THE REPORT OF THE PRESIDENT, AND THE SECRETARY'S
REPORT OF THE RECEIPTS AND
DISBURSEMENTS.

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THE BIENNIAL REPORT OF THE
BOARD OF TRUSTEES

OF THE

Agricultural College of Utah,

For the Years 1901 and 1902.

To the Governor and Legislative Assembly of Utah:

The Trustees of the Agricultural College of Utah have the honor to present their report for the biennium, January 1, 1901, to December 31, 1902.

We are pleased to report that during the past two years there has been a large increase in attendance and a great improvement in both the character and grade of work done. There has been marked growth in all the affairs of the College.

For a statement of the changes that have occurred during the last two years in the faculty and in the staff of the Experiment Station, and for a description of the condition and requirements of the College throughout the different departments, you are respectfully referred to the report of the President, which is submitted with our full approval as a part of this report.

We earnestly commend for your careful consideration that part of the report dealing with the importance of providing a permanent fund, or mill tax, for the support of the College. We concur in the estimates of what will be required during the next two years, for additional buildings and equipment, and for general maintenance. While the amounts asked for appear large in the aggregate, the growth of the institution makes imperative the necessity for much larger amounts to meet the different requirements of the institution. Indeed, the estimates are not only conservative, but in some particulars are unquestionably lower than they should be.

We recommend that a general appropriation for maintenance and equipment be made, instead of having

special appropriations for each of the requirements. This will give the Trustees greater freedom in the use of the money as the interests of the College may require. Conditions frequently change during a period of two years and there is a great advantage in being able to re-adjust the apportionment of funds as conditions may require.

It has been necessary to use on the farm buildings some of the money appropriated for general maintenance. But by the exercise of the most rigid economy, we shall be able to complete the year without a deficit for maintenance. To do this, however, it has been impossible to provide equipment that has been needed by some of the most important departments.

We would have been very much embarrassed, and the interests of the institution would have suffered to a very great extent, had it not been for the relief given us by the State Board of Examiners, in allowing a deficit of \$5,000 with which to finish the new front of the main building, and to provide sufficient furniture for its use during the present year.

A detailed statement of the receipts and expenditures during the past two years, an inventory of the College property, and a list of the College officials with their respective salaries, will be found in the appended report of the Secretary.

Respectfully submitted,

BOARD OF TRUSTEES,

By W. S. McCornick, President.

January 8, 1903.

PRESIDENT'S REPORT,

OF THE

AGRICULTURAL COLLEGE OF UTAH

FOR THE YEARS 1901, 1902.

To the Board of Trustees, Agricultural College of Utah:

Ladies and Gentlemen:—As required by law, the President of the College respectfully presents his report for the biennial period ending December 31, 1902, together with a statement of the condition of the different departments and of the requirements for the next biennium.

The past two years have been years of steady and healthful growth in all the affairs of the institution. Interest in the work of the College is rapidly growing among the people. There has been a large increase in attendance, and a great improvement in the spirit and character of the work of both faculty and students. Additional buildings and equipment have been provided, the faculty has been increased and strengthened, the standard of instruction has been raised, the courses of study have been revised and broadened, and a more complete and thorough organization of the several departments has been effected.

CHANGES IN INSTRUCTIONAL FORCE.

During the two years from January 1, 1901, to December 31, 1902, few changes have occurred in the instructional force and in the staff of the Experiment Station; though a number of additions have been made to meet the demands consequent upon the general growth of the institution.

On March 21, 1901, Miss Lydia Holmgren was employed until July 1, 1901, as assistant in stenography; and Osborne Widtsoe, B. S., a graduate of the College, was

employed until July 1, 1901, as station assistant in chemistry.

On April 27, 1901, Joseph Jenson, director of mechanic arts and professor of mechanical engineering, was given leave of absence for one year to take a course of study at Harvard University; James Dryden, assistant professor of meteorology and stenography, was relieved of his work in stenography and typewriting that he might devote his time exclusively to his work in meteorology and animal industry, having charge of the poultry work of the College and Station; Elvin J. Norton, secretary to the President, was employed as instructor in stenography and typewriting; Karl R. Moench, Ph. D., of the University of Leipsic, was employed as professor of modern languages; Peter A. Yoder, Ph. D., of the University of Gottingen, was employed as assistant station chemist and assistant professor of chemistry; Walter W. McLaughlin, B. S., a graduate of the College, was employed as assistant station chemist; and Joseph Nelson, a former student of the College who had taken the short course in agriculture, was employed as farm foreman.

On June 29, 1901, W. D. Beers, B. S., a graduate of the College, was employed as military instructor and as assistant in the irrigation department of the Station.

On September 25, 1901, Professor C. P. Close, who for two years had been in charge of the College and Station work in horticulture, botany, and entomology, resigned his position to accept a similar professorship in the Delaware Agricultural College, and was succeeded by Mr. J. A. Wright of Ogden, secretary of the State Board of Horticulture.

On April 26, 1902, Miss Louise Richards, instructor in art, was granted leave of absence for two years to study in Europe; Clarence Snow, who had been professor of physics since 1898, resigned his position to do work in the eastern states, and was succeeded by George P. Campbell, B. S., of Harvard University, who was employed as instructor in physics and in physical education; Julien P. Griffin resigned his position as foreman in forging; L. A. Ostien, B. S., Ph. B., was employed as instructor in mathematics and astronomy; J. W. Faris, who had been in charge of the commercial department since 1897, resigned his position to accept the principalship, at a large

increase in salary, of the Idaho Academy at Pocatello; Elias J. MacEwan, who for ten years had been connected with the College, first as professor of German and English and later as professor of English language and literature, resigned, and was succeeded by Alfred Horatio Upham, A. M., of Harvard University; Willard S. Langton was promoted from assistant professor of mathematics and astronomy to professor of mathematics and astronomy; Peter A. Yoder was promoted from assistant professor of chemistry to associate professor of chemistry.

On May 26, 1902, D. Earle Burchell of New York was elected professor of commerce to fill the vacancy caused by the resignation of Professor Faris; E. A. Williams of Massachusetts was employed as foreman in the forge shops; and Henry Jerome Stutterd of Salt Lake City was employed as instructor in art.

On June 17, 1902, E. J. Norton resigned as instructor in stenography and typewriting to accept a position in the Idaho Academy at a much higher salary; J. A. Wright resigned as professor of horticulture and botany to accept the editorship of the Inter-Mountain Farmer, his resignation to take effect July 1, 1902; David Stephens was employed as secretary to the President; Mamie Morrell, Dora Quayle, and Myrtie Barber were employed as assistants in the department of domestic science and art; and Charles Batt was appointed superintendent of buildings and grounds.

On July 1, 1902, Dr. E. G. Gowans, who for two years had been professor of animal biology, resigned his position to resume the practice of medicine.

On October 18, 1902, John H. Bankhead, W. A. Jensen, Ella Maughan, and D. M. Stephens were employed as assistants in the commercial department; Mrs. L. A. Ostien was employed as instructor in history; W. N. Hutt, B. S., of Toronto University, was employed as professor of horticulture and botany, to fill the vacancy caused by the resignation of Professor Wright; E. D. Ball, B. S., associate professor of zoology in the Agricultural College of Colorado, and graduate of the Iowa State College of Agriculture and Mechanic Arts, was employed as professor of zoology, his term of service beginning November 1, 1902; Robert Stewart, B. S., a graduate of the College, was employed as assistant station chemist; F. B. Linfield,

who for nine years had been in charge of the work in dairying, and since 1900, of the work in animal husbandry also, resigned his position to accept a similar professorship at a large increase of salary in the Agricultural College of Montana.

On December 19, 1902, R. W. Clark, B. S., of the University of Minnesota, was employed as professor of animal industry and dairying to fill the vacancy caused by the resignation of Professor Linfield.

ATTENDANCE.

According to the report of the registrar, three hundred and eighty-one students were registered in all the courses of the College during the year 1900-1901, as follows: seniors, 5; juniors, 7; sophomores, 15; freshmen, 39; specials, 34; sub-freshmen, 103; preparatory, 69; manual training, 106—40 in domestic arts and 66 in mechanic arts; unclassified, 3. The average age was 19.52 years. The record shows that there were 259 students from Utah, representing twenty-one different counties, as follows: Box Elder, 25; Cache, 139; Carbon, 6; Davis, 9; Iron, 2; Juab, 1; Kane, 2; Millard, 3; Morgan, 4; Rich, 2; Salt Lake, 12; Sanpete, 9; Sevier, 2; Summit, 6; Tooele, 5; Uintah, 2; Utah, 6; Wasatch, 2; Washington, 1; Wayne, 1; Weber, 20. There were 122 students from other states, as follows: Idaho, 108; Iowa, 1; Montana, 1; Nebraska, 1; Nevada, 2; Oregon, 1; Wyoming, 7; Russia, 1.

During the academic year 1901-1902, there were five hundred and sixteen students, registered as follows: seniors, 3; juniors, 14; sophomores, 14; freshmen, 31; specials, 68; first year, 91; second year, 88; third year, 2; preparatory, 73; manual training, 97—34 domestic arts and 63 mechanic arts; winter courses, 35. The average age was 19.5 years. The attendance from Utah was 378, representing twenty-three counties, as follows: Beaver, 1; Box Elder, 20; Cache, 216; Carbon, 4; Davis, 12; Garfield, 1; Iron, 4; Juab, 4; Kane, 1; Millard, 6; Morgan, 2; Piute, 1; Rich, 13; Salt Lake, 25; Sanpete, 15; Sevier, 5; Summit, 6; Tooele, 4; Uintah, 2; Utah, 7; Wasatch, 2; Washington, 3; Weber, 24. From other states there were 140 students, as follows: Arizona, 1; Colorado, 1; Idaho, 107; Indiana,

1; Michigan, 1; Montana, 5; Nevada, 5; Ohio, 1; Oregon, 5; Pennsylvania, 1; Wyoming, 10.

The number of students registered to December 15 of the present year is four hundred and forty-five. The ages range from 14 to 35, the average age being $19\frac{1}{4}$ years. Many of the students enter in January for the purpose of taking special work in mechanic arts, domestic arts, the different subjects of agriculture, and other subjects of the winter courses, arranged for the accommodation of those who cannot attend throughout the year. The total registration for this year will be about 600.

An examination of the record of attendance extending over a number of years shows a marked improvement in both the grade and class of work taken. During the period covered by this report, the increase in the number of seniors has been 100 per cent; juniors, more than 150 per cent; sophomores, 107 per cent; and counting the present second year students in the three-year courses who rank with the freshmen of the two preceding years, the increase in the number of freshmen has been 97 per cent. This increase is shown by a comparison of the total attendance for the two preceding years with the attendance on December 12 of the present year. This difference will be much greater when the comparison is made with the total registration of this year, as upwards of 150 students will enter after the holidays. The greatest improvement in the grade of work taken has been during the past year and a half. Comparatively fewer students are taking the preparatory or elementary courses.

One very encouraging feature regarding the attendance is the large number of students who enter the College for advanced work from high schools and other institutions of higher learning.

An equally favorable showing is made in the class of work selected by the students. A comparison of the present registration with the total attendance of the two preceding years shows an increase in the number of students taking work in agriculture of 106 per cent; in domestic science and art, 140 per cent; in irrigation and civil engineering, of over 300 per cent; in mechanic arts, 21 per cent; commerce, 109 per cent. The totals of 1900-1 and 1901-2 include the winter course students, while those for the present year include only students who are taking regular work extending through

the year. Large numbers of students take the special winter courses in the different subjects of agriculture, domestic science and art, and mechanic arts.

This record reveals a most favorable condition, indicating that the people of the state are coming more and more to appreciate the value of the practical distinctive work offered by the College. This is no doubt largely due to the success of former students and graduates in making practical application of their college work. A list furnished by the professors shows that many of the students who have been in the College from one to three years only are now working as carpenters, blacksmiths, contractors, and foremen, at from \$2.50 to \$4.50 a day; while others are equally successful in business, and in different lines of live stock, creamery, and farm work. Graduates from the domestic science school are engaged as instructors in domestic science and art in different schools of secondary and college grade in Utah and adjoining states. Of the eight students who graduated from the engineering department during the last three years, six are employed in active work in irrigation engineering, either in the field or as instructors in institutions of higher learning, receiving a salary of from \$100 to \$125 a month; the other two are doing general college work.

IMPROVEMENTS.

The last Legislature appropriated \$57,700 for the completion of the main college building and for farm buildings. On account of the advance in the prices of building material and in the cost of labor, it was found impossible to complete these buildings as originally planned. It was necessary to omit the piggery and to leave the interior of the east wing of the cattle barn unfinished.

The front of the main building has been completed at a cost of about \$48,500, exclusive of furnishings. This building is a substantial structure of brick and stone, 88 by 88 feet, and four stories in height, including basement. The basement is used temporarily for the armory and drill hall. The first story contains three class rooms and the administrative rooms, including the faculty room and the offices of the President, Secretary, and Registrar.

The second story is used for the library, containing the cataloguing room, the Librarian's office, the stack room, 32 by 66 feet, and the reading room, 46 by 66 feet. The Commercial department occupies the third floor, which contains the bookkeeping room, 35 by 83 feet, the office and department library, and rooms for typewriting and class work, besides the bank, freight, wholesale, and commission offices.

The removal of the library, the administrative offices, and the commercial department to the new building has given additional room for other departments, thereby greatly adding to the facilities for the work generally throughout the institution.

The department of physics has been removed from the second floor of the north wing of the main building to the rooms on the first floor formerly occupied by the library. The civil engineering department, which before the completion of the new building had one room on the second floor of the north wing, has been removed to the south wing on the same floor, where it is now provided with a large draughting room, an instrument room, an office, and a class room. The zoological and bacteriological laboratories have been moved from the second floor to the first floor of the north wing.

As reported two years ago, the rooms in the mechanic arts building that were used for the department of chemistry and for the Station chemical laboratory, were entirely inadequate and unsuitable for the work in chemistry. By the removal of the other departments from the second floor of the north wing of the main building, twelve rooms were made available for other work, and the chemical departments have been moved to these rooms. By removing the chemical laboratories to the main building additional rooms required for the work in mechanic arts were provided. The large room that was used for the students' laboratory has been fitted up for work in cabinet making, and the rooms that were occupied by the Station laboratory have been remodeled for the department library, the Director's office, a model room, and a class room.

Additional rooms have also been provided for the department of domestic science and art, a demonstration room for the work in household science and a large ad-

ditional room for the work in sewing being made possible by the completion of the new building.

The removal of the administrative offices from the first floor of the north wing made it possible to provide a class room for the department of zoology near the zoological and bacteriological laboratories; also offices for the professors of animal industry, English language and literature, and mathematics and astronomy.

The large rooms in the basement of the north wing that were formerly used for shops have been finished and equipped for the department of agronomy. They include the Agricultural Museum, a store room and preparation room for soil physics, the Agricultural Laboratory, and a class room. With the \$1,000 appropriated by the last Legislature, the department of agronomy has been provided with the necessary equipment for thorough and scientific work in the different subjects of soil physics.

For the work in dairying some additional equipment has been furnished and the wooden floors have been replaced by cement.

It was found impracticable to use the material in the general museum as required by the different departments of science, as these departments were so remote from the museum room that the material could not advantageously be carried back and forth, and there was not sufficient time for students to go from the class rooms and laboratories to the museum without interfering with their other work. Department museums have therefore been established, and the material of the general museum has been divided among the several departments and placed in rooms adjoining the laboratories where it is available when needed. The large museum room that was thus vacated has been divided into five class rooms that are used for work in language, geology, and mathematics.

In the basement of the south wing of the main building, a cement floor has been put in one of the small rooms and shower baths have been provided for the use of men engaged in athletic work.

The vegetable gardens have been moved to a plat of ground east of the veterinary hospital, and the entire area west of the experimental orchard and south of the main drive to the College farm has been leveled during

the past year, and is used during the fall and spring for drill grounds, as well as for the different athletic games, such as football, baseball, tennis, etc.

The horse barn has been remodeled at an expense of \$745, the basement being fitted up for horses and vehicles and the first floor for the storage of implements and farm machinery, for grain and seed bins, and for the farm foreman's shop.

The new cattle and sheep barns have been constructed at a total cost of about \$11,400, though it was impracticable, as reported elsewhere, to complete the interior of the east wing of the cattle barn. These buildings are among the very best of the kind in the west. They are equipped with the most modern conveniences throughout, and are admirably adapted for the most accurate scientific work.

The summer vegetation house and equipment for which \$1,500 was appropriated have been provided for the check work on the field experiments in agronomy and irrigation.

With the \$3,800 appropriated for pure bred stock, the following purchases have been made: 5 Shorthorns, 1 bull, 4 cows; 4 Herefords, 1 bull, 3 cows; 4 Holsteins, 1 bull, 3 cows; 4 Guernseys, 1 bull, 3 heifers; 5 Rambouillet sheep, 1 ram, and 4 ewes.

In addition to these, four pure bred sheep have been given to the College—2 Persian Fat Tails, by Hon. John Sparks, Reno, Nevada; 1 Rambouillet ewe, by Messrs. Nelson, Kearns & Co., Gunnison, Utah; 1 Rambouillet ram, by Mr. F. T. Jenson, Mt. Pleasant, Utah.

FACULTY.

The faculty at present numbers 47, including members of the Experiment Station staff. Of these there are 14 professors, 3 assistant professors, and 27 instructors and assistants, besides the Librarian, the President's private Secretary, and one assistant in the Experiment Station who has no work of instruction. Five professors, two assistant professors, and four instructors divide their time between the instructional work of the College and the work of the Experiment Station. Six assistants are pursuing regular courses in the College as students

and devote part of their time only to the work of instruction. In addition, student assistance is used in the laboratory work in science, in the library, in the critic work in English, and in the clerical work of the Registrar.

During the past year, three professors and one instructor have resigned their positions in the College to accept other positions at an increase in salary ranging from twenty-five to seventy per cent. A careful examination of statistics shows that the Agricultural College of Utah is paying lower salaries by from twenty-five to one hundred per cent than are paid for the same work by other similar institutions.

The demand for men and women who are able to do the work required in agricultural colleges, and similar institutions throughout the country, is greater than the supply. Consequently it is impossible to retain in the service of the College for any length of time professors whose experience, training, and ability, qualify them for the most successful work, unless the salaries approximate, at least, those paid for similar work by other colleges. Changes in the heads of departments unavoidably result in corresponding changes, more or less great, in both method and policy. Besides, it requires several years of practical experience with students and in the administrative work of a department for a young man, however scholarly he may be, to qualify for the responsibilities of a professorship. To allow professors, therefore, who have acquired that wisdom and breadth of scholarship which come only from years of experience, to withdraw from the College because of greater financial inducements offered by other institutions, is objectionable in the extreme. The stability and character of the work of all the departments depend largely upon permanency in the positions of the professors. Hence it is of the utmost importance in considering the requirements for the next two years that provision be made for such increase in salaries as may be necessary in order that too frequent and undesirable changes in the faculty may be avoided.

CHANGES IN COURSES.

In March, 1901, various questions of importance relating to the educational work and policy of the College

were referred by the President to different committees of the faculty. After a careful consideration of the different questions submitted, as involving the various interests of the institution, these committees presented their reports to the faculty and a number of important changes were made in the courses of study. The sub-freshman course and the elementary courses in commerce and agriculture were abolished, and regular three-year courses of high school grade were established in agriculture, domestic science, and commerce, each leading to a certificate of graduation.

It was thought that the advantages of the College for work in domestic science, agriculture, and commerce should be brought within the reach of young men and women who had completed the work of the district schools, but who were not prepared to enter upon the more advanced courses and could remain in the College but a few years. Accordingly, subjects peculiar to the different courses were introduced in the first year of the three year courses so that students upon entering the College would begin some of the practical work of the courses taken. The distinctive work of each course was increased and continued through the second and third years. These courses were also arranged so as to give the necessary preparation for admission to the college courses. In addition to the practical work, the prescribed subjects in English, mathematics, history, and science, afford the students good general training.

The manual training course in mechanic arts was increased from three to four years, and the manual training course in domestic arts was increased from two to three years. These courses also were revised and strengthened.

In all the high school and manual training courses, the work has been adjusted primarily with reference to the needs of students who are to pass from them directly into the various pursuits and industries of the state.

An additional year's work was prescribed for admission to the baccalaureate courses, thereby raising the standard of the regular college work one year. These college courses in agriculture, domestic science, commerce, engineering, and general science, were made co-ordinate, and were more clearly differentiated from the elementary or high school courses. Thus the advanced

work of the College was greatly strengthened and improved and the courses leading to degrees were made to correspond more nearly with similar courses in the best "land grant colleges" of the country.

At the time these change were contemplated, it was suggested that they were somewhat radical, and would result in a decrease in attendance. They were made, however, believing that the success of a college is not measured alone by the number of students that throng its halls, but rather by the thoroughness and efficiency that characterize its work—by what it actually accomplishes for those who pursue its courses. Moreover, it was thought that the educational and industrial conditions were such throughout the state that the interests of the people would thereby be best subserved. The wisdom of these changes has already been demonstrated by the increase in attendance and improvement in the spirit and character of the work throughout all departments.

In January, 1902, the Board of Trustees established courses in mining and electrical engineering. There had been a demand for work in these courses from the time of the establishment of the College. A mining course was announced at the opening of the College in 1890, but was discontinued after 1893. In 1896, the importance of providing for work in electrical engineering was emphasized in the report of the Trustees to the Legislature. As the demand increased during recent years for skilled engineering work in large irrigation projects, and in different manufacturing, electrical, and mining enterprises, there was a corresponding increase in the demand for more extended engineering work in the College.

PURPOSE OF THE COLLEGE.

The Agricultural College of Utah was established by the Territorial Legislature in 1888, in pursuance of an Act of Congress, approved July 2, 1862, donating public lands for the establishment and maintenance of colleges or institutions of higher learning in the several states and territories. The purpose of the College is clearly defined by the federal law, which provides that the income from the land grant fund shall be inviolably appropriated by each state,

"To the endowment, support, and maintenance of at least one college where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."

In 1888, the Territorial Legislature accepted all the provisions and conditions of this Act of Congress, and the faith of the territory was pledged to carry the same into effect. Section 8, Chapter LXII, of the laws of 1888, provides that,

"The leading object of the Agricultural College of Utah shall be to teach such branches of learning as are related to agriculture and mechanic arts, and such other scientific and classical studies as shall promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

Section 4, Article X, of the State Constitution, is as follows:

"The location and establishment by the existing laws of . . . the Agricultural College are hereby confirmed, and all the rights, immunities, franchises, and endowments heretofore granted or conferred, are hereby perpetuated unto said . . . Agricultural College"

The Act of Congress, approved August 30, 1890, for the more complete endowment and support of the "land grant colleges," provides that the money appropriated shall

"Be applied only to instruction in agriculture, the mechanic arts, the English language, and the various branches of mathematical, physical, natural, and economic science, with special reference to their applications in the industries of life, and to the facilities for such instruction."

It is evident from all national and state legislation regarding the "land grant colleges" that the purpose in the establishment of these institutions has been to make agriculture and mechanic arts co-ordinate as the leading interests, and to provide such general subjects as would insure a liberal as well as a practical education. They were not to give courses exclusively in agriculture, commerce, domestic science, or engineering; but were to cover the broad field of scientific and technical work best adapted in the different states to the varying and ever increasing needs of the industrial classes.

In an official statement of the Department of the Interior, approved December 7, 1900, the classification of the subjects included in the provisions of the Act of 1862, and the supplementary Act of 1890, is given as follows:

"Instruction in Agriculture.

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|----------------------|------------------------|
| 1. Agriculture. | 6. Dairying. |
| 2. Horticulture. | 7. Veterinary science. |
| 3. Forestry. | 8. Poultry industry. |
| 4. Agronomy. | 9. Apiculture. |
| 5. Animal husbandry. | |

Instruction in Mechanic Arts.

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|------------------------------|------------------------|
| 1. Mechanical engineering. | 10. Architecture. |
| 2. Civil engineering. | 11. Machine design. |
| 3. Electrical engineering. | 2. Mechanical drawing. |
| 4. Irrigation engineering. | 13. Ceramics. |
| 5. Mining engineering. | 14. Stenography. |
| 6. Marine engineering. | 15. Typewriting. |
| 7. Railway engineering. | 16. Telegraphy. |
| 8. Experimental engineering. | 17. Printing. |
| 9. Textile industry. | 18. Shop work. |

Instruction in English Language.

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|------------------------|--------------|
| 1. English language. | 4. Rhetoric. |
| 2. English literature. | 5. Oratory." |
| 3. Composition. | |

Instruction in Mathematical Sciences.

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|-----------------|---------------|
| 1. Mathematics. | 3. Astronomy. |
| 2. Bookkeeping. | |

Instruction in Natural and Physical Sciences.

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|----------------|-------------------------|
| 1. Chemistry. | 5. Metallurgy. |
| 2. Physics. | 9. Entomology. |
| 3. Biology. | 10. Physiology. |
| 4. Botany. | 11. Bacteriology. |
| 5. Zoology. | 12. Pharmacy. |
| 6. Geology. | 13. Physical geography. |
| 7. Mineralogy. | 14. Meteorology. |

Instruction in Economic Sciences.

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|-----------------------|---------------------------|
| 1. Political economy. | 3. Commercial geography." |
| 2. Domestic economy. | |

The following tables, compiled from government publications for 1900-1901 and 1901-1902, show the different courses offered by the 65 institutions of this class in the United States, with the number of institutions offering each course:

Courses Leading to Degrees.

Agriculture	57	Sanitary engineering . . .	4
Forestry	2	Steam Engineering . . .	3
Veterinary science	34	Chemical engineering . . .	15
Domestic science	26	Technology	2
General engineering	3	Architecture	10
Civil engineering	41	Special science	19
Electrical engineering	36	Commerce	5
Mining engineering	15	General science	37
Irrigation engineering	3	Liberal arts, etc.	30
Mechanical engineering	51	Pedagogy	3

High School or Elementary Courses.

Agriculture	33	Domestic arts	4
Mechanic arts	18	Commerce	16
Engineering	11	Normal	16
Domestic science	11	Academic and Col. Prep. .	16

Of the institutions included in the above report, 18 are state universities, in connection with which the agricultural colleges, or equivalent schools or departments, are maintained with the aid of the national funds. The following table shows the courses offered by the 47 colleges that are maintained separate and apart from the state universities, with the number of institutions offering each course:

Courses Leading to Degrees.

Agriculture	39	Steam engineering	1
Veterinary science	18	Chemical engineering	10
Domestic science	18	Technology	2
General engineering	1	Architecture	5
Civil engineering	25	Special science	9
Electrical engineering	23	Commerce	1
Mining engineering	7	General science	23
Irrigation engineering	3	Liberal arts, etc.	14
Mechanical engineering	35	Pedagogy	2
Sanitary engineering	1		

High School or Elementary Courses.

Agriculture	24	Domestic arts	4
Mechanic arts	15	Commerce	14
Engineering	3	Normal	11
Domestic science	7	Academic and Col. Prep.	14

In seven states, separate institutions for colored students are maintained under the Morrill Act of 1890. Of all the 65 institutions reported, only four do not offer courses in agriculture. Only one, the Massachusetts Agricultural College, is exclusively an agricultural college. The work in mechanic arts in Massachusetts is provided for in the Massachusetts Institute of Technology.

An examination of the reports of the work of the agricultural colleges shows that in some particulars the courses offered by the different institutions vary somewhat according to the conditions of their local environment. It is observed, though, that the general field of agriculture, mechanic arts, commerce, and domestic science is covered. A number of the institutions offer courses in philosophy, classics, and so on, as shown in the table under "Liberal Arts, etc."

However, as stated by Dr. True, of the U. S. Department of Agriculture, "The general atmosphere of these institutions tends to keep the students in sympathy with whatever promotes the advancement of American arts and industries. Agriculture has an honorable place in these colleges and the strengthening of the agricultural courses tends to bring them a more earnest and successful class of students. . . . In general, it may be said that the present tendency is to make these colleges schools of technology in which there shall be a great variety of technical and scientific subjects taught in direct relation to their application to many arts and industries and with special reference to the betterment of our industrial organization and life."

In this great work of industrial education, the Agricultural College of Utah is in line with the spirit and policy of the best agricultural colleges of the country. All the work throughout the institution is arranged in strict accordance with both the national and state laws. It is the purpose of the College to meet the needs of the people for a "liberal and practical education," and to promote the development of the varied resources and industries of the state.

SCOPE OF THE COLLEGE.

The Agricultural College of Utah comprises six different schools, besides the Agricultural Experiment Station:

School of Agriculture.	School of Commerce,
School of Domestic Science	School of General Science.
and Art.	School of Manual Training.
School of Engineering.	

These schools embrace eight baccalaureate courses, each extending through four years; three certificate or high school courses, each extending through three years; two manual training courses, extending through three and four years; and three winter courses, as follows:

Degree Courses.

Agriculture.	Civil Engineering.
Domestic Science.	Mechanical Engineering.
Commerce.	Electrical Engineering.
General Science.	Mining Engineering.

High School Courses.

Agriculture.	Domestic Science.	Commerce.
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Manual Training Courses.

Domestic Arts.	Mechanic Arts.
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Winter Courses.

Agriculture.	Domestic Arts.	Mechanic Arts.
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AGRONOMY AND VETERINARY SCIENCE.

Professor Merrill, who has charge of agronomy and veterinary science, reports that the improvement in the facilities for class and laboratory work and the changes in the courses of study, reported elsewhere, have resulted in much greater interest in the work of the department. The work of the first year begins with an elementary course in agriculture which deals only with foundation principles, and shows the importance of natural science in relation to agriculture. Although this is a new course in the College it has already proved popular and successful. Following this is given a course in rural engineering, which includes the subjects of irrigation, drainage, farm buildings, fences, and machinery. The third year course deals with soils and farm crops, and includes considerable work in laboratory experimentation. Three advanced electives are offered in soil physics, in agricultural experimentation, and in rural economics.

The following is from Professor Merrill's report to the President: "Beginning with the first year of the agricultural course, a course in agronomy is offered in each year of the three year courses, and through the advanced course with the exception of the sophomore year. The change in the course of study effected in 1901 makes

it possible for students to secure some work in elementary agriculture during their first year. This arrangement has resulted in awakening an interest in the agricultural work of the institution and the increased registration of students in this department is one of the most hopeful signs of progress. There is a growing appreciation among the young men of the state of the value of scientific knowledge as an aid to the art of agriculture. The demand for well-trained and experienced workers in agricultural science both in public and private positions has, perhaps, been a factor in promoting the interest in the work of the department.

"The courses in veterinary science have not received the attention which their importance in an agricultural college demands, as my time is fully occupied with the work in agronomy in the College and Station. All students in the agricultural courses receive instruction in veterinary science three days a week during the second term. In addition to these a clinic is held every Monday afternoon at which all students registered for veterinary work must be present.

"Students in agriculture electing animal industry as their major, receive, in addition to the above term's work, one year's work in anatomy and materia medica. Short winter courses are also given in agronomy and veterinary science. These courses are necessarily elementary, but are of undoubted value to practical farmers and young men who can spend but a few months away from the farm.

"The work in this department has not been, and should not be, confined to class room instruction; the information conveyed through experiments and investigations on the experimental farm and in the barns, and the work done in the farmers' institutes, through correspondence and otherwise, form a very considerable part of the work done in this department. . . .

"Through the liberal support you have given this department and the generosity of the last Legislature the equipment of this department is now very satisfactory. Indeed there are not more than five agricultural colleges

in the United States that have a laboratory equipped for agricultural work that begins to equal the equipment of this institution. The appropriation of \$1,000 made by the Legislature for equipping an agricultural museum, laboratory, and class room, has been almost entirely expended in the laboratory. The equipment purchased consists of two chemical balances, one compact machine, one grade apparatus, one Torsion balance, one Howe scale, one double-tree hitch apparatus, one drying oven, and in addition the apparatus for making a number of important investigations concerning soils. . . .

"The necessary apparatus for individual student's work has also been provided. The laboratory has been fitted with gas and desks for student work and a case provided for caring for the more delicate pieces of apparatus. A case for medicines has also been provided in connection with the work in veterinary science."

Some progress has been made in the equipment of the agricultural museum. Several models of plows and cultivators have been donated, and other gifts are acknowledged from various sources, including a complete set of manufactured products of corn from the Glucose Sugar Refining Company of Chicago. The value of an agricultural museum is very great. As soon as space can be arranged for them, instructive exhibitions of farm machinery, etc., can be readily secured through the courtesy of manufacturers, enabling students to consider the relative merits of the various designs. Of equal value are the exhibits of agricultural products, including the results of definite experiments. Varieties of cereals, grasses, etc., may be shown in bins and in the sheaf, and the comparative value of these varieties shown graphically. No cases, however, have been provided for this exhibit. Professor Merrill estimates that the cost of such cases as will be required during the next two years, including the preparation and material, will be about \$1,500.

ANIMAL AND DAIRY HUSBANDRY.

Professor Linfield reports an increase in the number of students taking courses in animal husbandry and dairying. He says:

"The new farm buildings, the pure bred stock, improvements in the dairy, and other general equipment provided during the past two years make the facilities for instruction much better than ever before in the history of the institution. The changes in the courses of study have resulted in great improvement in the work. As a result of these improvements the students are taking a more active interest in the agricultural work."

The instruction given in dairy husbandry includes courses in milk composition; milk testing; and bacteriology applied to dairying products; butter making; cheese making; organization, building, equipment and management of dairies; and practical dairying. In animal husbandry courses were given in breeds of live stock including the history and description of different breeds found on the farm, their origin and development, together with effect upon them of climate and management; breeding of live stock, dealing with the laws of reproduction, of heredity, revision, cross-breeding, etc.; management of live stock; stock feeding; judging of live stock, this course aiming to put into practice the knowledge gained in the class room.

As reported elsewhere, it was found impossible with the money appropriated by the last Legislature to complete the farm buildings, in accordance with the plans submitted in the last biennial report. After the bids had been received it was found necessary to omit the piggery and to leave the interior of the east wing of the cattle barn unfinished. With the money appropriated for the purchase of pure bred stock, it was not found practicable to get the hogs and as many different kinds of sheep as desired.

"At least four breeds of hogs should be secured, not only for the use of our students in the stock judging work, but also for the proper encouragement of this much neglected branch of the live stock industry of the state. Experience has shown that with pure bred hogs, properly cared for, we can expect a constant source of revenue. At least two sows and a boar of each of the following breeds should be secured: Berkshires, Poland-Chinas, Tamworths, and Yorkshire. This would give us two breeds of lard and two of bacon type hogs. At present but two breeds of sheep are represented, and it would

seem desirable to secure some good ewes of one of these (Shropshire) if we have a creditable representation of that breed. The Cotswold and Leicester should also be obtained."

The importance of the farm buildings and the pure-bred stock required in the work of the College and Station, was discussed at considerable length two years ago. Since the necessity for these additions was recognized at that time it is not thought necessary to encumber this report with a repetition of what was said then. It is urged, however, that the necessary appropriation be made for the completion of the sheep and cattle barns, for the construction of the piggery, and for the purchase of the pure-bred animals required. In addition, it will be necessary to provide bull paddocks and to fence the pastures for the different kinds of animals. Scales for the different barns and other incidental improvements are also required. A summary of the requirements of the department for the next two years, as taken from the reports of the professors to the President, is as follows:

Assistants required in the care of live stock.....	\$2,400
Feed for stock	1,300
Completing east wing of cattle barn	1,000
Ceiling and painting interior of cattle and sheep barns	700
Piggery	1,500
Pure-bred sheep and hogs	800
Bull paddocks, fences, etc.....	1,000
Scales, dairy equipment, etc.....	500
	<hr/>
	\$9,200

POULTRY.

The work in poultry offered by the College, comprises courses in poultry management, including a study of breeds of poultry, poultry buildings, feed and management, and a practice of the operation of incubators and brooders; breeds of poultry, in which is given more extended work in the study of breeds, breeding, and types, including practice in judging; the best methods of handling for specific purposes, natural and artificial incubation, poultry diseases, buildings and appliances, and the

practices of successful poultry keepers; and poultry experiments, a course arranged for students who desire to specialize in some branch of poultry work.

There is an increasing interest in the work of this department. Twenty-four students are already registered for courses in poultry this year. In addition to these a large number will take the winter course work. The small buildings used by the department were constructed at a time when there were no college courses given in poultry, and were planned exclusively for experimental work with a small number of fowls. The experimental work in poultry has now assumed such proportions that for it alone the demand for additional room is imperative. With proper equipment it would be possible to make this department practically self-sustaining. A suitable building, properly equipped, large enough to meet the requirements of the Experiment Station and for the students in the courses in poultry, would return to the state within a few years many times its value in the development of the poultry industry. The cost of the building including steam heating plant and equipment, is estimated at \$3,500.

The following is taken from Professor Dryden's report to the President:

"Our poultry work so far has cost comparatively little. Our present buildings, stock and equipment have not cost to exceed \$1,000. All expenses have been met from the government appropriation. The state has given nothing in the way of appropriations for poultry work and encouragement. According to the twelfth census the value of the eggs sold and poultry raised in the year 1899 was \$700,000, not taking into account the immense quantities produced in towns and cities. This was an increase of about one hundred per cent over the amount produced in the preceding census year, 1889. In the present year, with the higher prices for poultry products and the increased production, I estimate the value of poultry products in Utah at \$1,000,000. About every other branch of farm industry, and many of them rank far below the poultry industry as wealth producers, has received substantial recognition from the state.

"Our present building has a capacity for only one hundred hens. We have not the room and facilities for

raising young stock and eggs. The demand is increasing, and when our work of pedigreeing layers has gone far enough so that we have pedigreed stock to sell in any quantity there will be a great demand for such stock. As a result of the first year's work in selecting layers reported in the last poultry bulletin, we have had many inquiries for stock and eggs from certain layers, and these have come from many eastern as well as western states, and the past summer we shipped ten birds to New Zealand to a poultryman who had read reports of our experiments. Our next bulletin, in course of preparation, will report results on this line of experiments of greater value, without doubt, than anything that has ever been published, and I expect it to result in a great demand for stock. I believe it possible, with the proper facilities, to make the poultry department entirely self-sustaining, and at the same time produce experimental results of great value to the people of the state.

"With a larger building it will be possible to conduct experiments at a relatively smaller cost. With a larger building divided into pens for fifteen or more fowls, instead of pens large enough for only four or five as in the present building, the labor cost per fowl will be very much reduced. Fifteen can be fed as easily as four; four hundred as easily as one hundred, and the record keeping will be about the same for the larger pen.

Professor Dryden has been remarkably successful in his poultry work. His reputation extends beyond the United States to different countries of Europe and Asia. The best poultry authorities and writers of the country say that they "know of no experimental work with poultry so systematically and diligently pursued as that of the Utah Station." His bulletins are said to be a "record of experiments in poultry keeping such as cannot be found in any of the published works." One most noted writer says that the bulletin recently issued is "the most valuable publication on the subject" that he has ever seen.

BOTANY AND HORTICULTURE.

In the course in horticulture the following subjects are considered: Fruit growing, vegetable gardening, floriculture, including green house work and home win-

dow gardening, and forestry. In addition to the lectures and class room work, the students are given practical orchard demonstrations and are required in nursery practice to propagate all the varieties of fruits.

The work in botany is treated under three heads: Morphology, physiology, and histology. Physiological botany is given during the first term, the plants required in the work being secured from the green house. Morphology follows during the spring when plants are available. The work consists of a study of the forms of the root, stem, leaf, and flower, leading to a systematic classification of all native plants. In this course the students are required to make the usual collection of specimens. There is no course given at present in histological botany.

The following is taken from the report of Professor Hutt:

"The entomological work includes the types and classes of insect life. Special instruction is given on injurious insects, and particularly those common in the inter-mountain region. Collections are made and the students are given practice in identifying insects by their eggs, larvae, pupae and from their ravages. A practical study of insecticides and their application forms a prominent feature of the course.

"In giving such courses of instruction the College and Station orchards afford good illustrations in pomological work, but the course in practical greenhouse work has, under the present equipment, to be left out almost entirely, owing to the lack of a students' horticultural laboratory. Even for the students now registered in the course there are no propagation benches and not being able to do practical work in this line, they must go out at the end of college life with only a very limited knowledge of the subject. This places our graduates on a very unequal footing in comparison with the graduates of many other colleges.

"The registration for the second term is greater than the present enrollment, and I have no hesitation in saying that at the end of the biennium the present green house equipment will be found to be wholly inadequate.

"For permanent advancement in horticultural work, I would recommend that as soon as practicable, complete green houses be constructed to give separate compart-

ments for students' practice laboratory, conservatory plants, tropical plants, forcing house and propagating house. I would further recommend that as soon as possible a practical florist and landscape gardener be put in charge under the professor of horticulture, of the conservatory, lawns and campus."

Professor Hutt estimates that the work required in the conservatory, including incidental equipment and in the extension of the lawns, and the care of the grounds, will cost \$2,500 for the two years. The additional equipment needed in horticulture will cost \$200, in botany \$250, in entomology \$150.

FARMERS' INSTITUTES.

The Farmers' Institute work of the state has been placed by the Legislature in charge of the trustees and faculty of the Agricultural College. During the last two years forty-three cities and eleven different counties have been visited, and in most of these places formal institute meetings have been held. In others it was impracticable to hold meetings, but members of the faculty and station staff visited representative farms and studied local conditions as effecting the different agricultural interests. The information gained by members of the Station staff, and instructors in the different subjects of agriculture at the College, has been of great value in the preparation of lectures for institute work, and of articles for publication in the Institute Annual, and in the press. The College work in agriculture is in many respects made more valuable to the students because of the familiarity of the instructors with the agricultural conditions throughout the state. This work is practically a phase of College extension work, and can be done in a way to accomplish very much for those who are not able to take a course at the College.

In accordance with the requirements of the law, a 5,000-edition Farmers' Institute Annual was issued each year. These annuals contain addresses given during the year, and articles especially prepared upon agricultural subjects peculiar to Utah conditions. They are sent to persons whose names are on the Station mailing list, and to such others as apply.

On account of the increased duties of the members of the faculty, consequent upon the extension of the Station work and the increase in the amount of agricultural work taken by students, it has been impracticable to visit all the counties, particularly during seasons of the year when farmers have time to devote to institute work. Furthermore, the \$1,500 appropriated by the Legislature for Farmers' Institutes is not sufficient to pay for the publication of the Annual, which costs between \$600 and \$700, and to meet the traveling expenses of the lecturers. Many states much smaller than Utah, and in which the expenses of traveling are not so great, expend thousands of dollars a year in this work. While as much as possible is being accomplished with the money available, much more good would result from a larger appropriation.

After carefully studying the conditions in the state affecting the Farmers' Institute work during the past two years, a plan has recently been prepared in accordance with which the work will hereafter be more systematic, and will be extended to all the counties. The organization of county and district institutes or agricultural associations will be encouraged. Those interested in these organizations will receive such assistance as can be given by members of the College faculty. The local institutes or societies will be invited to co-operate with the College authorities in the Farmers' Institute work. They can be of great assistance in arranging for meetings, in advertising, and creating an interest generally. As far as practicable, it will be arranged for local speakers to join in the work.

Lady members of the faculty will also assist by delivering lectures of special value to women. Women's associations will be organized for the purpose of studying questions relating to the home side of farm life.

With the co-operation of the people, and the assistance of the leading citizens throughout the state, by following this plan much more can no doubt be accomplished than has heretofore been practicable.

DOMESTIC SCIENCE AND ART.

The courses in the department of domestic science and art have been strengthened and improved during the

past two years. The work has been popular and very successful. A much larger percentage of the lady students of the institution take courses in domestic science and art than ever before. The work given during the last two years includes laundering, cooking lectures and practice, foods, fruit work, sanitation and hygiene, science of nutrition, dietetics and invalid cooking, hygiene and home nursing, household management, hand and machine sewing, dressmaking, designing, cutting, fitting, fancy work, etc.

Mrs. Cotey, in her report to the President says:

“Changes in the courses of study in accordance with the new plan of giving a course throughout the year instead of for one term, has greatly strengthened the domestic science courses and increased the interest in the work.

“During both years lunches have been served as usual by members of the cooking classes, to the satisfaction of all interested. The demand for “guest tables” increases constantly, so that only a part of the requests can be granted without defeating the object of serving the lunches—the training of pupils in habits of neatness, deftness and propriety in table service.

“The rooms available in the basement for the practice classes are not large enough to accommodate the present size of the classes and the coming winter will see them too crowded to secure the best results in the work. The practical instruction in dinner getting and serving offered in the manual training course is so popular that the classes are too crowded for good work. The doors put through into the laundry have afforded some relief, but the arrangement is far from satisfactory, as the room is best suited for class room purposes and the stove is adapted for laundry work only.

“The department has suffered great inconvenience from the lack of a permanent class room and for want of a room for museum and laboratory. These rooms have now been supplied and when the necessary equipment is provided this lack will be overcome. The laundry is too small and the equipment insufficient for such large classes as are now enrolled. As there seems to be no satisfactory way of enlarging these rooms, a separate building for

domestic science and art will be a necessity in the near future.

"For several years an effort has been made to start a collection of samples showing the process of manufacturing standard foods, but no suitable place could be secured for keeping such samples. Two cases have now been provided, the purchase of bottles to hold samples allowed, and already about three hundred samples have been collected and properly labeled. This museum is a source of very great profit and pleasure to the department. The money outlay for these samples has been small. A set of blocks has recently been purchased from Pratt Institute showing the composition of the human body and proportionate amounts of different food classes required for its proper maintenance. These will be a valuable aid to the classes in nutrition. A number of new books pertaining to domestic science have been placed in the library.

"It has been a source of great satisfaction to the head of the department to receive requests for young women to give instruction in domestic science in other institutions and to be able to recommend graduates for such positions. As some instruction in domestic science and art will soon be given in the public as well as private schools, of this and surrounding states, there will be a demand for young women who are competent to give such instruction. In view of this fact, special effort has been made to induce our students to continue their work long enough to complete the domestic science courses.

"The work in the sewing department has never been in such a satisfactory condition as it is at the present time. I desire especially to commend the work of Mrs. Cook. Several new features have been introduced into the work of the sewing rooms that have been helpful. The pupils take more interest in the beginning needle work now that the models are placed neatly in books and retained in the department for inspection of visitors until the end of the year: the same is true of the muslin sewing that is displayed in the cabinets. The talks on textiles are much more beneficial and instructing to the pupils since the acquisition of sample cabinets showing the process of manufacturing silk, linen, cotton, etc. The most of these samples have been donated by eastern firms. Samples of fabrics have also been donated."

The growth of the department of domestic science and art has been such that much larger rooms for the cooking laboratories, for demonstration work, and for laundering will soon be necessary. Even at present it is with great difficulty that the work can be at all satisfactorily provided for. It is but a question of a short time when a domestic science building will be a necessity. Among the items of equipment that must be provided for the work of the next two years, are a number of stationery tubs, gas stoves, cabinets, additional tables, sewing machines, chiffoniers, etc. The cost of the material required will be \$500. In addition, it will be necessary to provide for a full instructor who will be able to take charge of the practice work in the kitchen, for a full assistant in sewing, and for additional student assistance.

COMMERCE.

The commercial department has made great growth during the last two years. The improvement in the character and grade of the work has been in harmony with the improved quarters and new equipment. The work throughout is characterized by thoroughness and efficiency. Regarding the purpose, work, and needs of the department, the following is taken from the report of Professor Burchell to the President.

"The purpose of the School of Commerce is to give thorough preparation for a general business career, whether the student afterwards pursues commerce, banking, financiering, transportation, merchandising, manufacturing, agriculture, engineering, mining, journalism, law, medicine, dentistry, etc., or enters the civil service. It not only offers the best preparation for a business career but also emphasizes such culture subjects as seem most valuable for the men in the various phases of their business, domestic, and social life. Throughout the courses special emphasis is placed on the importance of business integrity and the development of character.

"The distinctive work of the courses includes typewriting, commercial calculations, commercial papers, stenography, bookkeeping and retail business, commission business, wholesale business, corporations, business

customs, commercial law, commercial geography, and civil government; theory of value; money, credit and finance; banking, commercial organizations; materials of commerce; history of commerce; constitutional and international law; real estate; insurance; transportation, manufacturing, modern business methods, commercial problems of the day, commercial policy and practice of the United States; domestic trade and foreign commerce; economics, sociology, and business ethics. Practical application work in bookkeeping, stenography and type-writing is correlated in each year's work.

"In the work of the senior year the student selects a line of business in which he is most interested or in which he intends to engage. He carefully studies every phase of the subject giving special attention to this one line of business throughout the year. This experience not only gives him special preparation for one line of work but prepares him to go to the foundation of any line of business and study its various phases. Every course from first to senior year is studied from the practical business man's point of view.

"There is a demand for business trained young men in every occupation. The opportunities and prospects for the School of Commerce are as good as those of any other similar institution in the country.

"Among its students are already registered some of the most promising young men of the inter-mountain region. It is our duty to provide for them the best training possible. No matter how good the faculty may be, the best work cannot be done without ample equipment. The expansion into the new building has provided room, but the desk accommodation and other equipment are already inadequate. We must have additional desks, tables, chairs, typewriters, etc. The estimated cost of these is \$1,800.

"The department is very much in need of books. The students should have access to a number of the best books on the various subjects treated. A number of the best trade journals and commercial publications should be provided. For these, \$300 will be required annually.

"If we expect our graduates to successfully carry their responsibilities in the best business houses and offices we must surround them with, and give them the training in using, the best up-to-date office conveniences. We should have the various makes of filing cabinets,

copying devices, loose leaf ledgers, card systems, and other improved forms. We must acquaint the student with the various office and desk conveniences. In the study of all such apparatus, we should discuss the relative merits of each piece or system. Our counting room should be a model business office and working laboratory of business practice. This equipment will require \$400.

"It is already evident that this inter-mountain region is about to make large strides in manufacture. The water that irrigates the fertile valleys will first turn the wheels of industry. Much of such progress will depend upon our young men. Their special preparation becomes the duty of the commercial schools. Much can be accomplished with books, trade journals, etc., but to do practical work we should have a commercial museum. This equipment should consist of natural products of this and other countries; the manufactured products used in this region, other parts of the country, and abroad. Every article should be labeled with statistics of production and consumption with location of each, also cost of manufacture, transportation and other expenses of putting on various markets. It should also contain a library of statistics and afford opportunity for general research.

"We shall be able to get several hundred dollars worth of such materials from manufacturers, importers, etc., but we must provide cabinets and cases. As the work grows we shall continue to add, but to undertake the work we shall require at least \$500 for cases and cabinets and some articles that must be purchased. In addition to the foregoing about \$300 will be needed for incidental equipment.

"The following summary is the minimum that should be devoted to the School of Commerce for the next two years, and this amount when wisely expended will give the students what they have a right to expect from an institution of this character:

Typewriters, furniture, etc.	\$1,800
Library, periodicals, trade journals, etc.	600
Cabinets, files, office equipment, supplies, etc.	400
Museum cabinets, cases, materials, etc.	500
Incidental equipment	300
	<hr/>
	\$3,600

ENGINEERING.

The general plan of the work in engineering has been referred to in the statement respecting the schools of the College and changes in the courses of study. There is an increasing demand for work in different engineering courses. During the past year a number of advanced students have entered the College for this work, and the classes, as reported elsewhere, are much larger than ever before. A large number of students are specializing in irrigation work. This phase of engineering is emphasized in the College because of the need for skilled workmen in various large irrigation projects. The work is unusually successful. The main requirements for the immediate future are for additional instruments and laboratory equipment.

Professor Swendsen, in charge of the work in civil and irrigation engineering, says:

"The general plan of the work in civil engineering is somewhat different from that of general engineering courses. The aim has been to make the department strong in the instruction and field work of hydraulics and allied subjects. The other advanced branches of civil engineering, such as bridge design, railroad engineering and other general structural engineering courses, are replaced by strong courses in irrigation engineering and other courses in hydraulics. My reasons for thus concentrating effort on the questions allied to irrigation were stated in my former report, viz., the increasing demand for competent irrigation engineers. The demands on this department, both by students, because of their numbers and advanced standing, and by the public because of the lack of trained men in irrigation engineering, are becoming greater every year. The classes in the sophomore and senior years were unexpectedly augmented this year by the entrance of a number of students in advanced standing, and the return of others who have been out a year or two. The graduates of this department, for the most part, may be found now giving their exclusive attention to irrigation problems. Of the eight graduates since I came to the department, six are in active work in different irrigation lines. One is doing work in Harvard University and one

is teaching. Of the five who will graduate this year, four are working hard to become proficient in the same line, while one will do a year's work at Columbia College. In view of this tendency on the part of our graduates and students, it seems to me imperative that no effort be spared to increase the efficiency of this training. The demand for men trained in this line is greater than that in any other branch of engineering. This training is already the distinctive feature of the civil engineering work of the College.

"The equipment should be increased by at least one transit, one level, one level rod, and one water meter. There should also be a case provided for instruments, so that they may be properly displayed and preserved.

"The measurement of water is a very important subject in our state, and as yet there is no station provided for the rating of meters. Thus far we have sent our meters to Washington, D. C., for rating. It seems to me that this defect should be eliminated by the establishment of a station for rating meters, so that we may investigate properly the question of meter measurements.

"In line with the determination to make our work more thorough in hydraulic engineering, we should add to our equipment a cement testing machine. Cement is about the only structural material in which there must be tests for each enterprise under construction. Specifications always demand that tests of all cement be made by the engineer. Very little is known of our local cements. If a cement testing laboratory were added to our equipment it would be a source of strength to our course.

"There should also be means provided whereby students may be taken on excursions to important engineering structures. We are particularly behind in this respect.

"To carry out the plans for equipment mentioned above, we shall require \$1,540."

Regarding the additional equipment required, Professor Jenson, in his report to the President, says:

"In reporting the condition of the mechanical engineering department, I desire at the outset to emphasize the necessity of providing better laboratory facilities for this department. Our work in the theory of mechanical engineering may well be considered as abreast of that

done in leading engineering schools of today, but in laboratory practice we have been and are greatly deficient. In order that students may have the necessary experience in the handling and measurement of the properties of steam and steam power apparatus, there should be provided an experimental engine with steam gauges, engine indicators, wheel brakes, and ample weighing apparatus, as well as superheaters and condensers, calorimeters and injectors. I realize that to get a complete outfit for a steam engineering laboratory, a great expense would be involved, but for a comparatively small sum, enough apparatus could be obtained to enable us to do excellent work in connection with the steam heating plant of the College.

"The gas and gasoline engine has become so important a factor in the production of power, especially in small plants, that experimental engines of this type have been placed in the laboratories of all modern engineering schools. A small gasoline engine could be used to great advantage in this department.

"For a comparatively small sum, an equipment could be provided for the common work in gas and fuel analysis, which is a very important matter for every engineer who has to deal with the production of power economically.

"Measurement and transmission of electric energy is a very important part of every engineering course. We need for this work at least one small dynamo run from a motor supplied with the commercial current, at least two each direct and alternating current volt meters, ammeters, and dynameters.

"For general power measurement the department has a hydraulic dynamometer suitable for obtaining rough measurements of power, but additional apparatus for more accurate measurement is required.

"For testing the efficiency and lost work of various kinds of machinery and apparatus, such as the efficiency of belting, rope transmission of power, journal friction, and numerous other tests, a few standard indicator balances and two or three sets of standard weights, with some special driving apparatus, are needed.

"For testing materials such as wood, iron, rope, wire, cement, brick, stone, etc., a number of testing machines will be required, some of which are expensive.

"I wish therefore to emphasize the necessity of providing not less than \$5,000 to meet the more pressing demands of the department, and of making additions to this fund from year to year as the work increases."

MECHANIC ARTS.

As reported elsewhere, the manual training course has been increased from three to four years. The time required in the shops has been reduced from four to three hours a day. The students have correspondingly more time for their other work. Besides the practice work, lectures are given on materials and other subjects of special value to mechanics. The work is planned with a view of training intelligent mechanics in their respective branches of the course. In addition to the work of the regular four-year course, short courses affording practice in the use of hand and machine tools are arranged especially to meet the requirements of students who pursue courses in agriculture, engineering, and so on. The growth of the department and the increased needs of the students taking the more advanced courses, render necessary additional equipment. For several years the work has been done under many difficulties because of the lack of a foundry and sufficient number of machines to provide adequately for the work of the students registered. In the machine courses in metals this year there is a great loss of time caused by the necessity of dividing the class into small sections that the required machine work may be done. The director has general supervision of the work throughout the department, gives lectures on materials, etc., and has immediate charge of the work in drawing and designing. There has been a great improvement during the past year in the different branches of this department. The plans of the director have been approved, and the appropriations asked for are most earnestly recommended.

The following is from the report of Director Jenson to the President:

"The instructor in carpentry has immediate charge of all the work in wood, including regular bench work, turning, pattern-making, cabinet-making, stair-building,

etc., also polishing and finishing furniture. The instructor in forging has immediate charge of the black work in iron, including regular forge work, tool-dressing, carriage building, and horse-shoeing, and assists in vise work, in chipping, filing and hand fitting. The instructor in machine work has immediate charge of the machine work in iron, including the regular elementary work and machine construction, assists in vise work and also assists the director in drawing and descriptive geometry and other engineering subjects.

"The only improvement in the way of additional apparatus during the last two years has been to provide for the wood machinery room, a new power mortiser and borer. The rooms recently vacated by the chemical department have become available for a cabinet-making room, offices, and a class room.

"The growing interest and patronage of this department make it imperative that some additional room and considerable extra machinery be available for next year. As in my last report to you, I again urge the necessity of an iron foundry, not only that students may become familiar with the practice of the very useful art of moulding and running castings, but also that suitable material be furnished the machine shop for machine construction, thus affording a very valuable source of apparatus and machinery for the department; and also furnishing students an opportunity of actually building suitable designs which they may have worked out in the draughting room. The department is entirely incomplete without the foundry. Unavoidably, the machine shop is worked at an extreme disadvantage without its natural adjunct, the foundry.

"Many students have applied for work in wheelwrighting and the demand for this branch of our work is growing as the work of the department becomes known.

"It will be necessary to extend the forge shop. More students are registered this year for forge work than can be provided for even by having sections during both the forenoon and afternoon. It has been necessary to induce students who have applied for forge work to take carpentry instead this year because of insufficient room in the forge shop.

"After a very careful consideration of the entire work of the department, reducing everything to a minimum as a means of saving expense, the following is an estimate of the cost of the building and equipment required: Extension of forge shop, providing additional room for forge work, room for foundry and wheel-wrighting, \$2,800; equipment for foundry, etc., including exhaust pipe system, \$2,000; cupola and auxiliaries, \$500; ten double forges, \$400; special tools for wheel-wrighting, \$150; one belted power hammer, \$500; for carpentry, one 24-inch planer and smoother, \$500; one tennoning machine, \$200; one Universal wood trimmer, \$100; one pattern-maker's lathe with slide rest, \$200; twelve regular wood turning lathes, \$1,500; one band saw filing frame, \$50; for machine shop, three engine lathes, \$1,350; one crank shaper, \$350; one large chuck for gap lathe, \$50; shafting, hangers and belting for installing above machinery, \$125. The expense for maintenance during the two years will be \$3,500. With the foundry and other provided equipment, the department will be able to build a sand papering machine, a swing cut-off saw, 24 double benches, four veneering presses, and various other articles required."

CHEMISTRY.

The work in the department of chemistry has been strengthened and improved during the last two years. The general aim of the department is to provide thorough instruction in chemistry, emphasizing such courses as are of greatest value to students pursuing technical work in the different departments of agriculture, domestic science, etc.

Professor Widtsoe, in his report to the President, says:

"It is very encouraging to note the steady growth of the department since 1900; and especially to find the proportion of advanced students increasing.

"The department has been materially improved by having assigned to it the second floor of the north wing of the building. We shall now have room enough for growth, though it is undoubtedly a matter of only a few years until we shall outgrow even these quarters.

"Our present condition is the best that we have known for some time past. The indications are that a large number of College students will elect advanced work in chemistry hereafter, provided the institution can supply the necessary equipment. Our present condition would be very much better, did we possess a better and more complete supply of apparatus, chemicals and desk room. As it is, a large part of the energies of the instructing staff is consumed in scheming how to give high grade instruction with the equipment at our disposal.

"The number of students pursuing work in chemistry is now considerably in excess of the desk room. It is necessary to have elementary and advanced students do some of their work in the same room. It is important that the laboratory for advanced work, for which a room is now provided, be fitted up without delay. For the work in organic and agricultural chemistry, qualitative analysis, and the chemistry of foods and cookery, for all of which there is a large demand, considerable equipment will be required.

"Students in nearly all the courses are handicapped for want of live steam in the laboratory. Drying ovens must be heated by gas, at an unnecessarily great expense; distilled water must be obtained from the dairy, with the expenditure of much time and labor; and many experiments, involving the use of a continuous stream of steam must be omitted. A small steam boiler with suitable drying chambers, distilling coils, and other customary attachments should be provided at the earliest convenience.

"Our gas made from gasoline, owing to the impossibility of adjusting properly the inflow of air, is giving us much trouble, and causing much expense. An automatic gas mixer should be provided at once, if possible, to remedy this defect in our gas plant. The gas saved would, in one year, pay for the machine.

"The following is a summary of the requirements of the department, including only those things which are absolutely essential: Desks for 30 students (including plumbing and locks), \$300; hood for advanced laboratory, \$50; equipment for advanced courses, \$800; restocking for all courses, \$700; dark room, \$175; steam plant with ovens and still, \$300; fans and pipes, \$75; gas mixer, \$150."

GEOLOGY AND MINERALOGY.

The work of this department has included the courses in general geology, mineralogy, and assaying. There is an increase in the number of students taking the work. The following statement of the plan of work was taken from Instructor Peterson's report:

"The plan of the work in geology is to give thorough courses in dynamical, structural, and historical geology, emphasizing those points which are of practical use to the agriculturist and the engineer; to offer special work pertaining to the structural features of the earth, and to give advanced work in economic geology. This includes a study of the source, methods of preparation, commercial value, and the practical use of all mineral products, as well as nature's methods of forming metaliferous deposits.

"The plan in mineralogy has been to give enough laboratory work with blow-pipe analysis to enable the student to become familiar with the general characteristics and composition of all common rocks. In connection with this has been given a course in assaying for the common metals of value."

For the work in geology and mineralogy no permanent provision has been made. It will be necessary to finish rooms in the south basement of the main building and provide additional equipment for the work in assaying; also a room for laboratory work in geology and mineralogy. Exclusive of the cost of finishing the rooms, which should be provided for in the appropriation for repairs, \$700 will be required for museum cases, fixtures, tables, charts, etc.

ZOOLOGY.

The general equipment of the department of zoology is good and the work is being prosecuted with interest and success. Of the work and requirements, Professor Ball, in his report to the President, says:

"In planning the work of this department it is desirable to keep in mind the need of the agricultural and do-

mestic science courses. With this object in view, the physiological laboratory work should be changed so as to give some comparative work with other vertebrates. The comparison of a series of skeletons is the standard method of introducing the subject, and gives by far the best training for the time spent. A series of skeletons for class room work, including a disarticulated human skeleton, skeleton of a monkey, dog, seal, monotreme, fish, bird, snake, and frog, could be purchased for \$210. A better series, including a higher ape, instead of one of the monkey, could be obtained for \$300.

"There should also be a small amount of histological material purchased for this work, sections of bone, etc., that cannot be prepared here, and some sections of human tissue that we have no means of procuring. A rotary microtome should also be provided. These, together with the ordinary supplies of the laboratory for the next two years, will cost about \$175.

"There are nine microscopes belonging to this department at present, and eight to the horticultural department. Should the work conflict so that all of these were not available, there would not be enough. The department should have at least eighteen microscopes available at one time.

"For the zoological museum, a collection of Utah birds, male and female, their nests, eggs, and young, should be commenced at once. Such a collection would grow in value with the years. The greater part of the collecting and mounting can be done by the department, reducing the expense to the cost of the cases and a small amount for material and collecting expenses. In the same way, a collection of Utah insects, both a systematic and economic collection, should be made. A series of glass jars of various sizes should be purchased so that material in fishes, reptiles, and invertebrate forms can be preserved as it comes to hand. Two small aquaria, in which a few live forms of interest could be kept, would do much to awaken interest.

"The amount of work that can be done in all these lines depends largely upon the amount of money available for cases, etc. Two thousand dollars could be used to good advantage in building up the museum. Less than five hundred dollars for that purpose will mean that all the work cannot be attempted.

See pages 29 & 30 for Entomol

*150
250*

"For the work in bacteriology, \$100 will be sufficient for the incidental equipment and supplies."

PHYSICS.

An attempt is made to make the work in physics exceptionally strong because of its value in engineering and agricultural courses.. Lectures, class work, and the solution of problems, combined with the laboratory work, constitute the general plan followed. The department is well equipped for the more elementary work, except that there are not sufficient different pieces of apparatus for the accommodation of all the students without considerable inconvenience in the arrangement of sections. For the more advanced work some equipment is required. Of the plan of work, Instructor Campbell says:

"Laboratory exercises carried on by the student, 'practice in the observation and explanation of physical phenomena, some familiarity with the methods of measurement and some training of the hand and eye in the direction of precision and skill,' form the basis of the work. A part of the recitations is devoted to the consideration of numerous problems solved out of class by the students.

"The more advanced work includes a series of laboratory exercises which lead the student to look closely into the methods made use of, the theory of the instruments needed, the various sources of error and the possible deductions and principles which follow from the results obtained.

"The required equipment will cost \$1,500."

MATHEMATICS AND ASTRONOMY.

The courses given in the department of mathematics and astronomy, in addition to the more elementary subjects, include algebra, geometry, trigonometry, analytical geometry, calculus, differential equations, and general astronomy. Special efforts are made to have the work throughout this department especially thorough because of the importance of mathematical work in the engineering and other technical courses. The department has been more completely organized during the two years, the

classes have been divided into smaller sections, and a number of improvements made throughout. The work of the department is very satisfactory.

In his report to the President, Professor Langton says:

"The work of the department is more satisfactory than ever before. Three instructors devote their entire time to the department, and a fourth instructor gives three hours daily to mathematical instruction. The courses are divided into sections wherever that is necessary, no section containing more than forty students. The force of instruction is adequate for present needs.

"During the coming year the department will require the entire time of four instructors. Mathematics 6 will be given next year and more elective work will be required. The natural increase in attendance will require more sections in mathematics 2 and probably in mathematics I, thus requiring additional hours.

"A seminar room should be provided for the use of the department faculty and advanced students. In this room the department journals and the department library should be found and tables with drawers for the use of the students in the elective and advanced courses would add materially to the proper equipment of a department so large as this. A room for the storing of charts, models, instruments, etc., is also needed.

"The department should be provided with a telescope for work in astronomy. An instrument such as would fill our present requirements would cost \$450. There is at present a good class in practical astronomy and we have no equipment whatever.

"The department is very much in need of books for students in the advanced courses. They should also be provided with a case for models, instruments, etc.; the cost of this would be about \$550."

ENGLISH LANGUAGE AND LITERATURE.

Very thorough and satisfactory work is being done in the department of English. There are twenty-five different classes this year; aggregating an attendance of more than 600. At this time a professor and four instructors

are required. One very encouraging feature is the extent to which advanced elective courses are taken. It is important that a large purchase of books be made for the use of students in this department.

The following statement of the nature and plan of the work is taken from the report of Professor Upham to the President:

"The English department as it exists today, stands emphatically for two things: (1) Practical training in ease and correctness of expression; (2) appreciative knowledge of the best English literature in prose and verse. The standard of scholarship is to be maintained as high as is consistent with present conditions. Two important changes have been made in the past two years, one a change of classification growing out of the general advancement of standards in the College; the other, a modification of methods. In its modification of methods, the department is carefully considering the needs of this locality, and at the same time is following the lead of a great majority of the best institutions of the country. As soon as possible the student is placed in intelligent contact with the best models in literature and is given written work to do. By careful, stimulating criticism, he is encouraged to express his own thoughts and observations simply and accurately. The aim is throughout, to present the finer distinctions of usage as they appear in actual practice, rather than to burden the student with a mass of indigestible rules. The working principle is 'Common sense applied to language.'

"This year ten courses in English are being given, four assistants being employed in the more elementary work. Of these courses two are devoted to the study of prescribed English classics, and two to the foundation work in grammar and rhetoric. The work prescribed for second-year students is a thorough course in practical rhetoric, based on text-book and lectures and supplemented by required readings and numerous written exercises. In the freshman year the conventional divisions of English prose—exposition, description, narration, and argumentation—are studied and illustrated. Written exercises are again required and for part of the year a debating club is maintained in connection with this course. The second half year is largely employed in

studying the history and development of the English language. The English of the sophomore year takes the form of a historical and critical study of English literature from its beginnings. A text book is used supplemented by occasional lectures, and special stress is placed on the matter of prescribed reading, oral and written reports being required from time to time. Three elective courses are given this year, including the one in elocution. The Elizabethan movement in literature is being carefully considered in its rise and development, while another class is making a detail study of selected works of Chaucer and Shakespeare. Throughout the department the enrollment shows a consistent increase and the interest taken in the work is extremely gratifying.

"The greatest need at present is for increased library facilities. Where scientific departments have extensive laboratories and work shops, entailing a large expense, the department of English has and asks only its collection of books, literary and technical. Our present method of encouraging students to read largely from authors rather than about them, is essentially a laboratory method, and requires an assortment of books as representative as possible. At the same time we must keep pace with modern scholarship and possess our share of critical and technical works on language and literature. Obviously, then, the English department deserves a large library appropriation to carry on its work successfully."

MODERN LANGUAGES.

In 1901, the department of modern languages was established and a professor whose entire time could be given to language work was employed. Very good work had previously been done in German, and for a time during the earlier history of the College some work was done in French. As reported two years ago, the demand for modern language work in the different courses in science was such that it became necessary to provide work in French and Spanish and to extend the course in German. There are classes this year in all three of these languages. The attendance is good, and the interest in the work is very encouraging. Professor Moench reports that very satisfactory work is being done by the students. He says in his report:

"German and French are necessary and required in every higher institution of learning throughout the country. German and French are especially necessary in the Agricultural College for research work in sciences, not to mention the close intercourse between those countries now in commerce and travel in which those languages are spoken. The Spanish language will become more and more necessary in the future through the commercial interests with our new possessions."

HISTORY AND CIVICS.

The work in the department of history and civics is popular and successful. The increase in the number of classes, required by the additional courses given and the number of students in the more elementary work, made it necessary to employ part of the time of an instructor. The principal requirements of the department for the next two years will be for books.

The following is from Professor Engle's report:

"The history department in the Agricultural College of Utah aims to meet the demands for special historical work in the various departments; and also to give a preparatory or high school course in history. These two lines of work complicate the situation and render an ideal adjustment difficult. Heretofore a course in United States history has been given in the first year followed by courses in Greek, Roman, and Mediaeval history during the second year. This year the department reversed the preceding order. The general history is given during the first year in order to lay effectively the foundation for advanced work in United States history.

"During the next two years, if the Agricultural College maintains its past growth, the department of history and civics will require all of the time of the professor in charge, and the time of one competent instructor.

"The most imperative need of the department is library facilities. During the next two years not less than one thousand dollars should be expended in the purchase of historical literature, books, magazines, pamphlets, etc. The only laboratory students of history have is the li-

brary. If that is inadequate the best kind of work is almost impossible. Historical investigation goes on apace. One is not safe in consulting any work in history until he examines the date of the publication of the book. If we keep up with the times we must purchase each year new materials."

ART.

The work in free hand drawing has been unusually successful. The courses are arranged to meet the special needs of the students in the different courses of domestic science and art, agriculture, mechanic arts, etc. Work is also arranged for the accommodation of those who have special aptitude for art work. Miscellaneous equipment will be required, aggregating an expense of about \$300.

MILITARY SCIENCE AND TACTICS.

Commandant Beers, in charge of military science and tactics, reports the present registration as 186. The cadets are organized in a battalion of two companies. Greater interest is taken by the students in the work of this department than ever before. All the cadets are provided with uniforms. There are practically no applications to be excused from military drill. Considering the lack of proper facilities, the work is very satisfactory and successful. As reported two years ago, the military work is seriously interfered with during the winter months because of the impracticability of using the drill grounds. This difficulty has been partially overcome by the use of the basement in the new building as a drill hall. This room, however, is too small for the work, and even now, with only about two-thirds of the year's registration it is impracticable to use the room advantageously for more than three-fourths of the battalion at a time. The government inspector on his visit to the College last year again urged the necessity of a suitable building being provided for the military department. The Act of Congress of 1862 prescribes military science and tactics as part of the required work of the College. It is very important that adequate provision be made for successful work. The same building can be used for work in physi-

cal education, and would also serve as an amusement hall. It is strongly urged that \$30,000 be appropriated for this building.

PHYSICAL EDUCATION.

As stated in the last biennial report, "the importance of physical education in all institutions of learning is recognized throughout the educational world. No institution is regarded complete without ample provision for the proper symmetrical physical development of its students. It is not enough that provision be made for desultory physical exercise, or that students devote a certain length of time each day to particular kinds of manual labor. To produce the desired results, the growing student should receive regular scientific physical training under the direction of a specialist in this line of work."

It is impracticable under present conditions to provide adequately for work in physical training in the College. The room known as the gymnasium is on the top floor of the north wing of the main building, and answers fairly well for the light physical culture work of women, but is entirely unsuitable for general gymnasium work. The floor is not sufficiently strong to stand the strain of the various exercises in physical culture work.

The employment of a male instructor, part of whose time is available for work in athletics and physical education, has increased the interest taken in this work, and has already accomplished a great deal for the students. In the various athletic games and contests, the purpose is not to train athletes, but rather to provide a proper means for suitable physical exercises that will keep the students in a strong healthy condition. No education is complete which does not provide for physical as well as intellectual development. It is important that a building be provided without unnecessary delay, and furnished with necessary apparatus for drill work and corrective exercises. There should be proper bathing facilities for both men and women, as well as offices and class rooms. The best plan would be to provide a new building for the armory and gymnasium, using it for both the departments of military science and tactics and physical education.

LIBRARY.

According to the report of the Librarian, Mrs. Goodwin, there have been accessioned during the past two years 4,024 books, as follows: Agriculture, 127; engineering, 8; machinery, 5; electricity, 4; mathematics, 12; chemistry, 32; physics, 6; botany, 4; zoology, 9; biology, 6; entomology, 1; geology, 2; geography, 9; history, 134; English, 3; language, 29; fiction, 57; biography, 32; literature, 279; art, 8; music, 10; education, 9; business, 7; household science, 54; architecture, 1; miscellaneous, 28; dictionaries, 7; given by the government, 2,351; magazines bound, 790. In addition to the books named, the government has sent forty-six rolls of maps and charts. The library has regularly received 238 current publications, consisting of the quarterly and monthly magazines; the daily, semi-weekly, weekly, and bi-monthly papers covering the field of news, agriculture in all its departments, commerce, etc.

During the past two years, about \$1,500 has been expended for the purchase and binding of books. The removal of the library and reading room to the new building, as reported elsewhere, has resulted in a very great improvement in facilities for library work. Stacks for the books, and other library furniture have been provided. Other stacks, however, will be required during the next two years, and it will be necessary to get additional tables, chairs, and office furniture. It is of the very greatest importance that a card filing cabinet with equipment sufficiently large to meet the requirements of the library for several years, be provided without delay. There is a demand from all departments of the College for large numbers of books required by students in their library work.

The importance of a large library with proper equipment was urged two years ago. While the room is all that can be desired, and will answer the purpose of the library for several years, it is important that the equipment be made complete. A catalogueing outfit, reading tables, magazine racks, office furniture, and miscellaneous material will cost at least \$1,000. \$5,000 is a minimum requirement for books.

EXPERIMENT STATION.

The additional land provided for the irrigation investigations, the new buildings for work with stock, the vegetation house required in the work in agronomy and irrigation, and other additions made during the past two years, have added greatly to the facilities of the Experiment Station for accurate, successful work. More thorough organization of the departments has been effected, more systematic work is being done, and in many ways the usefulness of the Station in the development of the agricultural interests of the state has been increased. The growth of the work adds unavoidably to the cost of maintenance. The Station has now reached a point where the extent of its development and usefulness is dependent upon the assistance of the state. Very little has been done by the state heretofore in promoting this phase of the College work.

The general plan of the work has not been changed during the last two years. The following is a statement from the Director's report to the President, regarding the work accomplished, including an estimate of the requirements for the next biennium:

"Experiments have been conducted in agronomy, and excellent results obtained on the following subjects: Variety testing with wheat, oats, barley and other grains, corn, potatoes, sugar beets, lentils and grasses; the maintenance of soil fertility by means of crop rotation and proper fertilization; methods for the eradication of dodder; the growing and the value of soiling crops in this state; soil and crop treatment under different systems of irrigation."

"Work in horticulture has been done in the following subjects with very important results: Variety tests with numerous kinds of orchard trees, and small fruits; keeping qualities of different varieties of fall and winter apples; spraying experiments in Logan and Provo to combat the codling moth; thinning peaches at Brigham City, and ringing grape vines at Ogden."

"In the department of animal industry, experiments on the fattening of lambs have been continued. During the last winter special attention was given to beet pulp

and molasses as stock feeds. Some work has been done, also, with cow feeding. Under the direction of the agronomist, horse feeding experiments have been continued.

"The work in poultry has been continued along the satisfactory lines laid down in earlier experiments. Special attention has been given in the last two years to the development of a strain of poultry with high egg laying qualities.

"As in former years, a large portion of the work of the department of chemistry has been done in connection with the experiments of other departments of the Station. Independent investigations have been made on the composition of Utah soils; the right time to harvest crops; the influence of irrigation upon the composition of crops; the germination of seed under various conditions of soil moisture; the composition of Utah drinking and mineral waters; composition of sugar beets, and miscellaneous analyses for the people of the state.

"The department of irrigation engineering has made numerous seepage measurements, having in view the determination and correction of seepage losses from irrigation canals; it has also begun a systematic water survey of the state, and has made contributions towards our knowledge of the use of water.

"The fundamentally important subject of irrigation has been studied by the departments of agronomy, chemistry, and irrigation engineering. Two hundred plats have been used for this work during the last two seasons, and thousands of measurements, analyses and other operations have been made in the prosecution of the work. The results have been unusually valuable. The departments of agronomy and chemistry have co-operated in the study of the relation of water to soils and crops by means of a series of pot experiments, made possible by the erection of the vegetation house granted by the last Legislature.

"A study, having in view the reclamation of the extensive alkali lands of the state, has been undertaken by the Station in co-operation with the Bureau of Soils, on a forty-acre tract of land near Salt Lake City. The results of the first year are very promising and lead to the belief that the soluble salts may be removed permanently from alkali lands."

"Extensive studies have been made upon the possibilities of dry or arid farming in the state, with very encouraging results.

"During the last two years, eight bulletins and two reports have been published. Three bulletins have been ready for the press for some time, three are practically finished, and material is on hand for about twelve other bulletins—all on important subjects. The titles of the bulletins published are as follows: 70, Pork Production in Utah; 71, Carrying Capacities of Irrigation Canals; 72, A Soil Survey in Salt Lake Valley, Utah; 73, Experiments in Butter and Cheese-making; 74, Lead Ore in Sugar Beet Pulp; 75, Arid or Dry Farming; 76, Forcing Lettuce; 77, Horse Feeding; also, the eleventh and twelfth annual reports.

"Our future work is resting on a carefully prepared plan, the central subject of which is irrigation. For the details of our proposed work I may refer you to earlier reports that I have made to you, and to my report in the twelfth annual report of the Station. The distinctive feature of the operations of the Station at this time, is that they are parts of a carefully matured plan, the completion of which is brought nearer, with the ending of each year.

"I have explained in earlier reports the difficulty of publishing the results of our investigations, in the best manner, with the funds at our disposal. A great amount of important data is now awaiting publication, but there is no prospect, under present conditions, that more than a small fraction can be published within the next few years. Then, there are insistent demands for new bulletins summarizing our work on lucern, poultry, stock feeding, etc., etc., to which we are unable, for lack of funds, to give any heed whatever. An annual appropriation by the state of \$1,000 for the purpose of publishing full reports of our investigations would benefit, greatly, the agricultural interests of the state.

"The departments of agronomy, horticulture, and irrigation require, for many of their experiments, deeper soils than are found on the College farm. I explained this matter fully in my last report and asked at that time for twenty acres of bottom land. An appropriation of \$1,000 was made by the last Legislature in response to this re-

quest. The rise in land values made it impossible for us to procure more than six acres of land, with certain improvements, for the money appropriated. This land is wholly devoted to the work in irrigation. The work in agronomy and horticulture should be provided for, if possible. So important do we deem this matter, that, for the next year, a small tract of bottom land has been leased, on which the more pressing problems will be studied.

"The work of the poultry department has made the Utah Station world famous. At the present moment our poultry department stands first among the experimental poultry plants of the world. However, almost every state in the Union is now establishing a more or less elaborate plant for experimental and instructional purposes, and, to maintain our pre-eminent position, we must increase the facilities of the department. The growth of our poultry work is hardly possible unless it is given a larger and more commodious building than it has now. This new building should be so large as to allow room also for the poultry collections used by the College for instructional purposes. Professor Dryden has given careful attention to the matter of cost of such a building and estimates that it will cost \$3,500.

"The wing of the cattle barn designed in part for steer feeding experiments was left unfinished, owing to the insufficiency of the funds provided by the state. Likewise the proposed piggery was not built. These two items should be provided for in order to make successful work in steer and pig feeding experiments possible. The estimates of cost are already in your possession.

"The question has occasionally arisen concerning the extent to which the Station should pay from the Hatch fund for fuel, light, water, and general maintenance for the quarters occupied by the Station officers. The amount involved is small, about \$750, yet, should it be provided for by the State, would go far in furthering the interests of the experimental work of the College.

"One of the most important operations in our experimental work with grains is the correct and complete separation of the grain from our small farm plats. We have found it impossible to do this with any ordinary thresher. A satisfactory machine would have to be made especially for this purpose. This is also a pressing need

of the Station which should be met before next summer. The cost of a suitable machine with power would be about \$400.

"The general condition of the Station is very good. The lines of work now followed yield good results; the work of the last two years has been very successful, and the officers are laboring unitedly and to their best ability for the furtherance of the interest of the Utah farmers. The future of the Station has never seemed brighter, and its power for good, greater.

"I state, here in tabular form, the cost of the more immediate and important needs of the Experiment Station; for as many as possible of which appropriations should be made by the present Legislature. The item of finishing the new barns, and providing a piggery, is omitted, as the details of cost are in your possession:

1. General maintenance	\$ 750.00
2. Printing	2,000.00
3. Poultry building	3,500.00
4. Thresher with power	400.00
<hr/>	
Total	\$6,650.00

"These items are not simply desirable, but are necessary, if first class results are expected from the work of the Station officers. The Utah Station must be in the front rank of stations, to gain that position we must have facilities for work."

DORMITORY.

Mrs. Karl R. Moench, matron of the Dormitory, reports that from 40 to 65 students have been in the Dormitory during each of the last two years. On account of the lack of sufficient boarding places in Logan, the Dormitory has been a great assistance in providing accommodations for students. During the past two years about \$1,000 has been expended in repairing the building, but it had been so long since any extensive repairs were made that even this sum proved entirely inadequate to do what really was necessary. On account of the defective flues it had been found impracticable to use some of the rooms

during certain seasons of the year. Repeated efforts have been made to correct this difficulty, but without success. Conditions at the Dormitory have so improved that by putting in a steam heating plant, and making some additional repairs, all the rooms in the building could be used throughout the year in such a way as to make the Dormitory a source of revenue to the institution. The entire cost of the heating plant and the repair work required will be about \$3,500.

PERMANENT TAX.

The question of securing a regular income sufficient to provide adequately for buildings, equipment, instruction, and research, is one of the most important questions for consideration in connection with the work of institutions of higher learning. The policy followed in this country varies in different states. In some states institutions depend largely, if not entirely, upon periodical appropriations. In others, a regular income is provided for maintenance, and special appropriations are made at such periods as conditions warrant to meet certain requirements of development. Some states make appropriations for particular purposes, extending over a term of years: in California, in addition to the income from the mill tax, etc., \$100,000 per annum has been provided for the next ten years; the Iowa Legislature, at its last session, appropriated about \$600,000 to the State College of Agriculture and Mechanic Arts for buildings, one-fifth of the amount to be used annually for five years.

During the last two weeks, letters upon this question have been received from Dr. Harris, United States Commissioner of education, and from nearly all the presidents of state colleges and universities in the United States. The consensus of opinion is, (1) that the state should provide a permanent fund for the support of its institutions of higher education; (2) that this can best be done by a regular statutory levy on the assessed valuation of state property.

It is important that a permanent fund be provided for the reason that it is necessary for an institution of learning to know at least approximately for some time in advance what the income will be, so that definite plans may be made for the future.

The mill tax levy, if the rate is a reasonable one, is more satisfactory than the fixed annual appropriation, because the income of the institution will increase in proportion to the growth of the state.

The following institutions receive a mill tax varying from one-fifteenth of a mill to two mills on each dollar of the assessed valuation of state property: University of Arizona, University of California, University of Colorado, State Agricultural College of Colorado, Colorado School of Mines, Iowa State College of Agriculture and Mechanic Arts, Purdue University (the land grant college of Indiana), Indiana University, State College of Kentucky, University of Nebraska, Nevada State University, University of New Mexico, New Mexico College of Agriculture and Mechanic Arts, New Mexico School of Mines, State University of North Dakota, North Dakota Agricultural College, Ohio State University, Oklahoma Agricultural and Mechanical College, University of Oklahoma, and the University of Wyoming.

The following extracts from letters recently received indicate the judgment of college and university presidents upon this question:

Acting President Stanton, Iowa State College of Agriculture and Mechanic Arts: "The plan of providing money for the maintenance of higher institutions of learning in such a way as to enable them to lay definite plans for the future is exceedingly desirable. It is greatly to be preferred to the hand and mouth policy of biennial appropriations. We have tried both plans and would consider it a great calamity if we had to return to our former method."

President Snyder, Michigan Agricultural College: "Much greater good can be done with a certain sum of money if it comes in the way of a mill tax, for the reason that your board knows what it can depend upon and can make plans accordingly. We have our plans made ahead for the coming five or six years, and we are not held up by contractors as we have been when the money was limited and had to be used within a certain time and for a specific purpose. Last year we thought of putting in a heating plant. We had plans drawn and got bids, but found that everything was so high in price it would be better to defer until we could buy to better advantage."

We are now watching the market and when steam pipe drops a little, we shall buy. If we advertise and have any suspicion that there is a combination of any sort formed, we can simply throw the whole matter over. . . . I believe it is both better for the institution and better for the State to have a fixed annual income."

President Angell, University of Michigan: "We prefer the present plan for this reason and others; namely, that it is necessary for an institution of learning to know with reasonable certainty for some time in advance what its supplies are likely to be. It must lay its plans, not from year to year, but for considerable time in the future, and this can only be secured by adopting a plan of a mill tax. . . . I think all the states that have tried this plan find it to be a wiser one than the old plan. It also costs the Legislature much less trouble, because when specific appropriations are to be voted, a good deal of time must be expended in considering the necessity for each one, and this used to be sometimes quite annoying to the committee and to the Legislature."

President Northrop, University of Minnesota: "Undoubtedly a state tax is the most comfortable way to meet current expenses—and to supply buildings, also if the tax be large enough."

President Birge, Wisconsin University: "The appropriation for the University should be made a permanent one."

President Houston, Agricultural and Mechanical College of Texas: "Such a plan is not only less expensive because it saves time of the Legislature, but also because it enables the authorities to plan systematically and wisely."

President Worst, North Dakota Agricultural College: "I much prefer a mill tax and consider it the only proper support for an educational institution. . . . The College grows constantly and so does the sum received from the mill tax."

President Andrews, University of Nebraska: "The best method, it seems to me, to arrange an income for a state institution would be to have a mill tax, or whatever it may be, to be used by the institution without depending upon special appropriations each biennium."

President Aylesworth, Colorado State Agricultural College: "We greatly prefer the fixed rate of revenue with a possibility of a special appropriation when needed."

REQUIREMENTS.

The following statement of the requirements of the Agricultural College of Utah from the State Legislature is based on the most conservative estimate of what is absolutely necessary in order to provide for successful work throughout the institution. It has been found impossible to reduce the amount for the following reasons:

First.—On account of the increase in the cost of all kinds of building material, as reported elsewhere, it was not possible with the money appropriated to complete the new buildings and to make the other necessary improvements. Even after the hog house had been omitted and the interior of part of the cattle barn left unfinished, it was necessary to use several thousand dollars from the general maintenance fund in order that the buildings might be sufficiently completed and equipped for use.

Second.—The use of money from the the maintenance fund for buildings made a corresponding reduction in the amount available for apparatus and supplies. To keep up the equipment and provide for proper growth more money is therefore required for the next two years.

Third.—The condition of the College buildings was such that in order properly to preserve the property and keep the rooms in suitable condition for class and laboratory work, the use of more money than had been estimated for repairs was unavoidable.

Fourth.—The increase in the amount of advanced work called for by the students and the large increase in attendance made it necessary to employ additional instructors. In the effort to reduce the amount asked for two years ago, a sufficient amount had not been allowed for salaries, considering the increase required in the instructional force.

Fifth.—It was necessary to increase the salaries of professors during the last year. Even then, as explained in another part of this report, several members of the

faculty resigned to accept positions elsewhere at from twenty-five to seventy per cent increase in salary.

Sixth.—As the College grows both in attendance and in the grade of work done, correspondingly more money is required for equipment and general maintenance. To continue the work of the Experiment Station to the best advantage, it is necessary that the state assist not only in providing equipment but also in meeting the expense of maintenance. The proper care of farm buildings and pure bred stock is also expensive.

Seventh.—Notwithstanding the efforts of the Board of Trustees to reduce the expenses in every way possible throughout the institution, except for the relief afforded by the State Board of Examiners in allowing a deficit of \$5,000 with which to complete the front of the main building and furnish it sufficiently for use, it would have been impossible to close the year without seriously impairing the efficiency of the work.

BUILDINGS AND IMPROVEMENTS.

The cost of completing the cattle and sheep barns, and of fencing pastures, yards, paddocks, etc., will be	\$ 2,700
The building for hogs, required by the students in agriculture and for the work of the Experiment Station, will cost.	1,500
The poultry building, to be used by students and for the work of the Experiment Station, will cost.	3,500
To provide room for the iron foundry and for carriage building, and to extend the forge shop, will require	2,800
The cupola and auxiliaries will cost	500
The armory and gymnasium required for the work in military science and tactics and in physical education, will cost for building and equipment	30,000
Steam heating plant for the Dormitory will cost.	3,500
	<hr/>
	\$44,500

EQUIPMENT.

Equipment of foundry	2,000
Instruments, machinery, and laboratory equipment for engineering	5,500
Machinery and other equipment for iron forge shop, carriage shop, and machine shops for wood and metals	5,425
Thresher and power for the Experiment Station	400
Pure bred stock,—sheep and hogs	800
Books for library, as needed by the different departments	4,000
Equipment for agronomy, horticulture, chemistry, commerce, domestic science and art, dairy, geology and mineralogy, zoology, physics, mathematics and astronomy, etc	10,550
	<hr/>
	\$28,675

MAINTENANCE.

Insurance on buildings and equipment	2,100
For general maintenance, including salaries, janitorial services, fuel, general equipment and supplies, power, electric light, maintenance of farm buildings and care of stock, maintenance of library, printing and advertising, painting and repairs, care of grounds, and other general and incidental expenses	60,450
Experiment Station, for printing	2,000
Experiment Station, for heat and light, etc	750
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	\$65,300

Total appropriation required for buildings and improvements, equipment, and general maintenance \$138,465

Respectfully submitted,

W. J. KERR, President.

January 7, 1903.

Secretary's Report

*Of Receipts and Disbursements for the Years
1901 and 1902.*

Logan, Utah, January 1, 1903.

To the Board of Trustees of the Agricultural College of Utah.

Ladies and Gentlemen: I respectfully submit to your honorable body the following report for the biennial period beginning January 1, 1901, and ending December 31, 1902, showing the receipts and disbursements of the College for that period, a list of officials and their salaries.

Detailed account of the receipts and expenditures of the Agricultural College of Utah during the two years beginning January 1, 1901, and ending December 31, 1902:

GOVERNMENT COLLEGE FUND.

Receipts—

Amount on hand December 31, 1900,	
as per last report	\$13,205.82
Received from government appro-	
priation	50,000.00
Total	<hr/> \$63,205.82

Expenditures—

In department of agriculture, for	
salaries	\$ 4,286.13
In department of mechanic arts, for	
Salaries	10,730.00
In department of English language,	
for salaries	12,274.96
In department of mathematical	
science, for salaries	9,254.81
In department of natural science,	
for salaries	8,767.13

In department of natural science, for stock and material	20.50	
In department of economic science, for salaries	5,707.82	
Total		\$51,041.39
Amount remaining December 31, 1902		12,164.43

EXPERIMENT STATION FUND.

Receipts—

Balance on hand December 31, 1901, \$	544.08	
Received from government appropri- ation	30,000.00	
Received from sale of farm products, etc.	4,782.32	
Total		\$35,326.40

Expenditures—

Salaries	\$14,853.07	
Labor	9,838.52	
Publications	1,780.07	
Postage and stationery	585.00	
Freight and express	158.08	
Heat, light and water	566.42	
Chemical supplies	522.95	
Seeds, plants and sundry supplies . .	1,534.75	
Fertilizers	78.60	
Feeding stuffs	1,185.89	
Library	143.50	
Tools, implements and machinery . .	943.41	
Furniture and fixtures	259.93	
Scientific apparatus	200.10	
Live stock	1,402.66	
Traveling expenses	364.15	
Contingent expenses	46.35	
Building and repairs	1,726.02	
Total		\$36,189.47
Amount due from government		863.07

STATE FUND.

Receipts—

Received from state treasurer—

For general maintenance... ..	\$48,916.75
For library	327.49
For manual training	1,599.37
For winter course	2,615.00
For conducting Farmers' Institutes	2,776.49
For completing and furnishing the front part of main building....	45,000.00
For construction and maintenance of farm buildings	11,200.00
For constructing cement floor in dairy	250.00
For construction and equipment of vegetation house... ..	1,286.14
For purchasing additional land and water rights	1,250.00
For purchasing pure bred stock...	3,730.56
For equipment of agricultural laboratory, museum, and class rooms	907.34
For insurance on buildings and contents	2,052.60

Miscellaneous Receipts—

Profits on military suits	1.75
Sale of old engine	318.00
Farmers' Institute advertisements	53.00
Freight rebate on equipment	1.85
Freight rebate on vegetation house	26.33
Library books lost and paid for by students	4.50
Sale of old lumber	45.50
Fees, typewriting, biology, etc...	185.00
Rent of Dormitory	85.00
Certificates and diplomas	7.50
Dairy sales	881.23
Horticultural sales	17.10
Greenhouse sales	142.95
Bookstore sales	4,857.96

Entrance fees	4,855.50
Mechanic arts department receipts (sales and fees).....	961.94
Chemical department receipts (sales and fees)....	246.00
Domestic arts department receipts (sales and fees)....	404.85

\$135,007.70 \$135,007.70

Expenditures—

Equipment and supplies	\$ 5,665.24
Salaries	18,055.94
Postage and stationery	978.47
Repairs on buildings	4,308.18
Steam heat apparatus and repairs..	847.21
Furniture and furnishings	3,645.95
Improvements on grounds	2,521.10.
Incidental expenses	453.69
Library	1,537.34
Janitor and student labor	3,997.95
Water works and sewerage	126.18
Telephone and telegraph.....	379.81
Water	481.03
Freight and express	100.52
Printing	2,450.20
Advertising	1,159.79
Traveling expenses	863.71
Fuel	3,341.21
Electric light and power.	2,040.00
Farmers' institute	2,459.44
Bookstore	5,089.15
Insurance on buildings and contents	2,052.60
For equipment of agricultural laboratory, museum, and class rooms.	969.92
Purchase of pure bred stock	3,730.56
Purchase of additional land and water rights	1,250.00
Constructing and equipping vegetation house	1,525.33
Constructing cement floor in dairy..	336.34

Mechanic arts	2,742.55	
Winter course	1,651.67	
Domestic arts	349.81	
New building	48,566.45	
Construction and maintenance of farm buildings	12,100.52	
	<hr/>	
	\$135,777.86	\$135,777.86
		<hr/>
	\$	770.16

SUMMARY.

Receipts—

From government fund	\$ 63,205.82	
From Experiment Station fund	35,326.40	
From state fund	135,007.70	
	<hr/>	
Total receipts	\$233,539.92	\$233,539.92

Expenditures—

Government fund	\$ 51,041.39	
Experiment Station fund	36,189.47	
State fund	135,777.86	
	<hr/>	
Total expenditures	\$223,008.72	223,008.72

LIST OF OFFICIALS AND THEIR SALARIES.

	Per Year.	
William J. Kerr, president of the faculty	\$3,000.00	+ from
John A. Witdsoe, director of the Experiment Sta- tion and professor of chemistry	2,000.00	income
Dalinda Cotey, professor of domestic science	1,300.00	
Joseph Jenson, director of work shops and pro- fessor of mechanical engineering	1,600.00	
George L. Swendsen, professor of civil engineer- ing	1,600.00	
John F. Engle, professor of history and civics	1,600.00	
Willard S. Langton, professor of mathematics and astronomy	1,600.00	
Karl R. Moench, professor of modern languages	1,200.00	+ from

Lewis A. Merrill, professor of agronomy and veterinary science	1,300.00	<i>House three</i>
Alfred H. Upham, professor of English language and literature	1,600.00	
D. Earle Burchell, professor of commerce	1,600.00	
W. N. Hutt, professor of botany, horticulture and entomology	1,500.00	
<u>E. D. Ball, professor of animal biology</u>	<u>1,400.00</u>	
R. W. Clark, professor of animal industry	1,400.00	
Peter A. Yoder, associate professor of chemistry	1,400.00	
James Dryden, assistant professor of meteorology and animal industry	1,400.00	
Edward W. Robinson, assistant professor of commercial law and geography	1,200.00	
John T. Caine, Jr., principal of preparatory department and instructor in English	1,200.00	
Sara G. Goodwin, librarian	1,000.00	
Ruth E. Moench, instructor in English and physical culture	900.00	
August J. Hansen, foreman in carpentry	1,000.00	
John A. Crockett, instructor in dairy husbandry	700.00	
William Peterson, instructor in geology and mathematics	1,000.00	
Peter W. Maughan, secretary of Board of Trustees and instructor in penmanship	1,100.00	
Samuel B. Mitton, instructor in music	500.00	
Herbert W. Hill, instructor in English	1,100.00	
Rena Baker, instructor in English	900.00	
Lydia Holmgren, instructor in domestic science.	300.00	
Edward P. Pulley, instructor in mechanical engineering	600.00	
Rhoda B. Cook, instructor in sewing and Millinery	900.00	
Walter W. McLaughlin, instructor in mathematics and mining, and assistant chemist.	900.00	
William D. Beers, instructor in military science and assistant in civil engineering	900.00	
L. A. Ostien, instructor in mathematics and astronomy	1,200.00	
George P. Campbell, instructor in physics and athletics	1,400.00	
Edwin A. Williams, foreman in forging	1,080.00	
Henry J. Stuttard, instructor in drawing	700.00	

Robert Stewart, Station assistant in chemistry..	600.00
Mamie S. Morrell, assistant in household science	200.00
David M. Stephens, president's private secretary and assistant in commerce	360.00
Dora Quayle, assistant in domestic science	120.00
Myrtie Barber, assistant in domestic science.	100.00
Ella Maughan, assistant in commercial department	300.00
W. A. Jensen, assistant in commercial department	150.00
John H. Bankhead, assistant in commercial department	315.00
Mrs. L. A. Ostien, assistant instructor in history	240.00
Carrie McAlister, assistant in secretary's office	300.00
J. B. Nelson, farm foreman	660.00
John Hopkins, assistant in poultry department	600.00
Charles Batt, superintendent of buildings and grounds	900.00
R. O. Larsen, janitor.	540.00

Respectfully submitted,

P. W. MAUGHAN,

Secretary.

W. S. McCORNICK, President.

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